ICATION CHANGE NOTICE ASSIGNM[illegible]OG

CONTRACTOR: AUTONETICS

FIGURE A/MRCN: 41037

S-118 41037 PT I

SCN NO	ECP NO	MIP NO	ECS NO	CMOD	CCRD A	CCRD D	ADCN NO	O	C	SCD NO	REMARKS
	MX-1-B										Rev A
	2-10										Rev B
1	3-2				BMO						
2	18-1										
3	33-1										
5	25-1										
6	53-4										
7	71-1				BMO						
8	157-1										

OO-ALC FORM JUN 70 402

SPECIFICATION CHANGE NOTICE

DATE PREPARED: 5 Nov 87

1. ORIGINATOR NAME AND ADDRESS	2.	3. FSCM NO.	4. SPEC NO.
Rockwell International Corporation Defense Electronics Operations 3370 Miraloma Ave., P.O. Box 3105 Anaheim, CA 92803	☐ PROPOSED ☒ APPROVED	94756 5. FSCM NO. 94756	S-M-X-410378, Part I Dated 30 Sept 1981 6. SCN NO. 8

7. SYSTEM DESIGNATION	8. RELATED ECP NO.	F04704-82-C-0020 F04704-84-C-0025 F04704-85-C-0085 F04704-87-C00029	10. CONTRACTUAL AUTHORITY BMO PKAD 11-17-87 CCBD 11-5-87
Peacekeeper	157-1		

11. CONFIGURATION ITEM NOMENCLATURE	12. EFFECTIVITY
Electronics Battery	S/N EBD0039 and Subs

THIS NOTICE INFORMS RECIPIENTS THAT THE SPECIFICATION IDENTIFIED BY THE NUMBER (AND REVISION LETTER) SHOWN IN BLOCK 4 HAS BEEN CHANGED. THE PAGES CHANGED BY THIS SCN BEING THOSE FURNISHED HEREWITH AND CARRYING THE SAME DATE AS THIS SCN. THE PAGES OF THE PAGE NUMBERS AND DATES LISTED BELOW IN THE SUMMARY OF CHANGED PAGES, COMBINED WITH NON-LISTED PAGES OF THE ORIGINAL ISSUE OF THE REVISION SHOWN IN BLOCK 4, CONSTITUTE THE CURRENT VERSION OF THIS SPECIFICATION.

13. SCN NO.	14. PAGES CHANGED (INDICATE DELETIONS)	* S	* A	15. DATE
8	I-3, dated 5 November 1987	X	-	5 Nov 87

SCN NO.	ECP NO.	SUMMARY OF PREVIOUSLY CHANGED PAGES	EFFECTIVITY			
Record	1-8	Complete revision, reissued Part I as revision "A", dated 17 December 1980	N/A	-	-	12/17/82
Record	2-10	Complete revision, reissued Part I as revision "B", dated 30 September 1981	S/N EBD0001 and subs	-	-	9/30/81
1	3-2	I-19, dated 28 April 1982	S/N EBD0001 and subs	X	-	4/28/82
2	18-1	I,ii, I-iii, I-3, I-4, I-7, I-8, I-9, I-16, I-19, dated 16 March 1983	S/N EBD0001 and subs	X	-	3/16/83
3	33-1	I-5, dated 13 April 1983	S/N EBD0001 and subs	X	-	4/13/83
4	27-2	I-4, dated 14 September 1983	S/N EBD0039 and subs	X	-	9/14/83
5	25-1	I-i, I-ii, I-3, I-4, I-11, I-12, I-13, I-17, I-18, I-28, dated 15 August 1984	S/N EBD0039 and SUBS	X	-	8/15/84

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16. TECHNICAL CONCURRENCE — DATE

FORM 831-N-54 REV 11-80

"S" INDICATES SUPERSEDES EARLIER PAGE. "A" INDICATES ADDED PAGE

SPECIFICATION CHANGE NOTICE

DATE PREPARED: 5 Nov 87

1. ORIGINATOR NAME AND ADDRESS	2.	3. FSCM NO.	4. SPEC NO.
Defense Electronics Operations Rockwell International Corporation 3370 Miraloma Avenue P.O. Box 3105 Anaheim, California 92803-3105	☐ PROPOSED ☒ APPROVED	94756 5. FSCM NO. 94756	S-M-X-41037B, Part I dated 30 September 198 6. SCN NO. 8

13. SCN NO.	14. ECP NO.	SUMMARY OF PREVIOUSLY CHANGED PAGES	12 EFFECTIVITY	* S	* A	15. DATE
6	53-4	I-7, I-25, dated 3 July 1985	S/N EBD0039 and Subs	X	-	7/3/85
7	71-1	I-iii, I-4, I-6, I-12, I-13, I-16, I-19, I-21, I-22, I-28, dated 25 July 1985	S/N EBD 0039 and Subs	X	-	7/25/85

FORM 831-N-55 REV 9-84

"S" INDICATES SUPERSEDES EARLIER PAGE. "A" INDICATES ADDED PAGE

S-M-X-41037B
Code Ident 94756
Part I of Two Parts
30 September 1981

CRITICAL ITEM DEVELOPMENT SPECIFICATION
FOR
MISSILE X ELECTRONIC BATTERY
(CI 0041037)

Authenticated by Ballistic Missile Office Configuration Control Board (CCB) Directive dated 30 September 1981

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1. SCOPE

1.1 This specification establishes the performance, design, development, and test requirements for qualification of the Missile X (MX), Guidance and Control (G&C), Dual Voltage Electronic Airborne Battery critical item (Configuration Item 0041037), hereinafter referred to as the Battery.

1.2 Classification. This paragraph not applicable to this specification.

2. APPLICABLE DOCUMENTS

2.1 Government documents. The following documents of the exact issue shown form a part of this specification to the extent specified herein. In the event of conflict between the contents of this specification and the listed documents, the contents of this specification shall be considered to be a superseding requirement.

SPECIFICATIONS

Federal

QQ-S-766C	15 Dec 66	Steel Plates, Sheets and Strip - Corrosion Resisting
QQ-P-35B Amendment I	5 Apr 73 26 Feb 75	Passivation Treatments for Corrosion - Resisting Steel
BB-H-1168B	9 May 77	Helium, Technical

Military

MIL-C-38999G Supplement I Amendment I	7 Dec 77 7 Dec 77 22 Dec 78	Connectors, Electrical, Circular, Miniature, High Density, Quick Disconnect, Environment Resistant, Removable Crimp and Hermetic Solder Contacts, General Specification for
MIL-W-6858D	28 Mar 78	Welding Resistance: Aluminum, Magnesium, Nonhardening Steels or Alloys, Nickel Alloys, Heat Resisting Alloys, and Titanium Alloys; Spot and Seam
MIL-W-8611A	24 Jul 57	Welding, Metal Arc Gas, Steels and Corrosion and Heat Resistant Alloy, Process for
MIL-G-45204B	26 Feb 71	Gold Plating, Electrodeposited

Air Force

S-M-X-41017B	30 Sept 81	System Specification for MX Guidance and Control System

STANDARDS

Military

MIL-STD-143B	12 Nov 69	Standards and Specifications, Order of Precedence for Selection of
MIL-STD-810C	10 Mar 75	Environment Test Methods
MIL-STD-130E	5 Aug 77	Identification Marking of Weapon System Military Property
MIL-STD-1472B Notice 1 Notice 2	31 Dec 74 10 May 76 10 May 78	Human Engineering Design Criteria for Military Systems, Equipment and Facilities
MIL-STD-454F Notice 1 Notice 2 Notice 3	15 Mar 78 1 Sep 78 30 Jun 79 10 Sep 79	General Requirements for Electronic Equipment
MIL-STD-889B	7 Jul 76	Dissimilar Metals
MIL-STD-1568A (USAF)	24 Oct 79	Materials and Processes for Corrosion Prevention and Control in Aerospace Equipment

OTHER PUBLICATIONS

SAMSO-STD-77-7	10 Nov 77	Standardization and Control of Parts, Materials and Processes for Missiles and Support Equipment

2.2 Non-Government documents. This paragraph is not applicable to this specification.

3. REQUIREMENTS

3.1 Item definition. The Battery supplies 76.5 volts direct current (Vdc) and 31.0 Vdc power for the MX Inertial Measurement Unit (IMU) and other missile electronics. It consists of two groups of cells, activation mechanism, canister, and a hermetically sealed connector. The Battery is a primary, automatically activated silver oxide-zinc type and activation will be initiated by a Through Bulkhead Initiator which is part of a MX Ordnance Initiation System (OIS) (CI 0041027).

3.2 Characteristics.

3.2.1 Performance.

3.2.1.1 Insulation resistance. The insulation resistance between the connector pins and the Battery canister shall exceed 1 megohm.

3.2.1.2 Output voltage. The Battery shall output the voltage specified in the table below when discharged to the load profiles of 3.2.1.3 for a minimum of 1260 seconds (s) after activation.

Battery Section	Voltage (Vdc)	Tolerance (Vdc)	Applicable Load Profile
High Voltage	76.5	+5.0 -4.0	Figure 1 (0-30s)
	76.5	+3.5 -4.0	Figure 1 (30-1260s)
Low Voltage	31.0	+3.5 -1.8	Figure 2 (0-60s)
	31.0	±1.8	Figure 2 (60-1260s)

3.2.1.2.1 Transient voltage. The Battery shall exhibit no transient voltages greater than 600mV maximum due to load current changes within the frequency range of 3 kilohertz (kHz) to 10 kHz in the 76.5V Section.

3.2.1.2.2 Voltage deviations. There shall be no erratic voltage output, as evidenced by terminal voltage changes of more than 0.5 V in less than 1 s, independent of voltage changes negatively proportional (see 6.3.8) to changes in discharge current, from 4 to 1260 s after start of activation.

3.2.1.3 Load profile. From 4 to 1260 s after start of activation, the load profiles shall be as shown in Figures 1 and 2 within the voltage regulation as specified in 3.2.1.2.

3.2.1.4 Interbattery isolation. The electrical isolation between the 76.5 V battery section and the 31.0 V battery section shall be 40 decibels (dB) minimum.

3.2.1.5 Leakage current. Within 1260 s after activation, the leakage current from the negative terminals to the Battery Canister shall not exceed 10 milliamperes when the load profile of 3.2.1.3 is applied.

3.2.1.6 Reverse current - 76.5V Section. During activation, conduction of current in the reverse direction (positive to negative terminal internal to the battery) shall not be greater than 4.0 amperes through the 76.5V Section of the battery.

3.2.1.6.1 Rate of change. The reverse current rate of change shall not exceed 40 amperes per second.

3.2.1.6.2 High current period. Reverse current exceeding 1.0 ampere shall be limited to a period of 500 milliseconds.

3.2.2 Physical characteristics.

3.2.2.1 Mass properties. The weight of the Battery shall not exceed 43.0 pounds-mass (see 6.3.4) and the center-of-gravity after activation shall be as shown in Figure 3.

3.2.2.2 Dimensions. The Battery dimensions shall be as specified in Figure 3.

3.2.3 Reliability.

3.2.3.1 Launch and flight reliability. The Battery launch and flight reliability (see 6.3.1), for a minimum time period of 1260 s, shall be at least 0.998 during and after exposure to the non-nuclear environments of 3.2.5.11.

3.2.3.2 Service life. The Battery shall have a service life (see 6.3.2) of at least 10 years.

3.2.4 Maintainability.

3.2.4.1 Removal and replacement. Assuming free access, the mean time to remove and replace the Battery shall be 1/2 hour (h), maximum, excluding surface preparation and post installation sealant time.

3.2.5 Environmental conditions. The Battery shall meet the requirements of 3.2.1 after exposure to the following unpowered environments and shall meet the requirements of 3.2.1 (except 3.2.1.1) during and after exposure to the following powered environments: (peak shock, acceleration, and vibration environments are not concurrent).

3.2.5.1 Natural and modified.

3.2.5.1.1 Pressure. The pressure environments are:

a. Unpowered in the transport and basing phases: 16 to 1.5 pounds per square inch (lb/in^2) absolute.

b. Powered in the preflight and flight phases: Atmospheric pressure-time history as specified below:

Time (s)	Pressure (lb/in² absolute)
-60	16.0
0	16.0
10	14.7
20	13.1
30	9.9
40	5.4
50	2.2
60	0.61
80	0.12
109.4	1.3×10^{-3}
113.5	1.3×10^{-5}
180.5	3.9×10^{-6}

3.2.5.1.2 Temperature. The temperature environments are:

a. Unpowered in transport, basing and preflight phases:

Withstanding: -58 degrees Fahrenheit (F) to 126 degrees F
Preflight: 45 degrees F to 100 degrees F

b. Powered in the preflight and flight phases:

Preflight: 45 degrees F to 100 degrees F
Flight: 45 degrees F to 135 degrees F

3.2.5.1.3 Humidity. The powered and unpowered relative humidity is the maximum moisture content of air corresponding to a dew point of 81 degrees F or 90 percent relative humidity at any applicable temperatures, whichever is less.

3.2.5.1.4 Fungus (powered and unpowered). The fungi, indigenous to the continental United States, consists of fungus growth occurring on nutrient organic materials, including contamination from greases, oils, and dust.

3.2.5.1.5 Ozone (basing and preflight). The powered and unpowered environment, during periods of high ozone concentration, is an average of 0.08 ppm by volume, in air, over a 12 h interval, with a peak of 0.12 ppm. The annual average is 0.025 ppm.

3.2.5.1.6 Sand and dust (powered and unpowered). The sand and dust environment consists of settling particles with diameters ranging from 3.94×10^{-6} to 5.90×10^{-3} inch.

3.2.5.1.7 Corrosive atmosphere (powered and unpowered). The corrosive atmosphere consists of 21.3×10^{3} ppm by mass of sodium chloride with a fallout of 5.74×10^{-4} lb/ft^{2} per year. Other elements are equivalent to exposure to a maximum relative humidity of 85 percent at a maximum temperature of 95 degrees F for an exposure time of 15 h; the moisture consists of a maximum of 3.7 percent sodium chloride by mass.

3.2.5.2 Induced.

3.2.5.2.1 Accelerations.

a. Sustained acceleration. Linear acceleration conditions for the batteries are:

(1) The powered steady-state longitudinal (see 6.3.5) acceleration is 9.6 gravities (g).

(2) The unpowered steady-state lateral acceleration is 2.5 g.

b. Angular motion. The powered angular oscillatory motion is specified in Figure 4.

3.2.5.2.2 Shock.

a. Transportation and handling. Unpowered transportation and handling shocks will be no more severe than those induced during launch and flight.

b. Unpowered preflight mobile. The unpowered shock characteristics shall be characterized by a terminal peak sawtooth pulse shape having a duration of 0.25 s. The number of such shocks and their respective magnitudes are specified below:

Number of Shocks	Vertical Amplitude in g	Horizontal Amplitude in g
8	0.10	0.05
25	0.16	0.08
25	0.34	0.17
7	0.64	0.32
1	0.91	0.46
1	1.14	0.57

c. Powered launch and flight. The powered launch and flight shock spectra envelope is specified in Figure 5.

3.2.5.2.3 Vibration.

a. Unpowered vibration. The unpowered vibration level at the Battery mounting points is as specified in Figure 6.

b. Powered vibration. The powered vibration level at the Battery mounting points for launch and powered flight is as specified in Figure 7.

3.2.5.2.4 Acoustic. The powered acoustic environment is as specified in Figure 8.

3.2.5.3 Nuclear radiation and EMP. The Battery shall meet the performance requirements of 3.2.1 during and after exposure to the environments of Appendix IV of S-M-X-41017.

3.2.6 Transportability. The Battery shall be transportable by road, rail or air when the environments as specified in 3.2.5 are not exceeded.

3.3 Design and construction. The Battery shall be of the dry-charged type with an electrolyte reservoir and activator assembly. The canister shall contain a provision for breaking a hermetic seal to reduce expansion after activation and provide access and accommodation for a tube which may be attached to conduct away all vented products. The Battery shall be dried, purged, filled with dry 100 percent Grade A helium at 0 to 2 lb/in^2 gauge.

3.3.1 Materials, processes, and parts. The order of precedence for the selection of specifications and standards shall be in accordance with MIL-STD-143. The requirements of MIL-STD-454 shall apply, except Notice 2, change pages 13-1 and 13-2, is not applicable. Parts derating shall be in accordance with SAMSO-STD-77-7.

3.3.1.1 Dissimilar metals. Contact between dissimilar metals, as defined in MIL-STD-889, shall be avoided on the exterior of the Battery.

3.3.1.2 Bonding. The battery shall provide bonding as follows:

a. Metal-to-metal bonds between the Battery and adjacent conductive pieces and interfacing hardware shall have electrical contact over areas which are held in mechanical contact. They shall have a maximum resistance of 2.5 milliohms.

b. Bonding straps are prohibited.

3.3.1.3 Battery canister shielding. Battery canister shielding, including the half of external connectors mounted to the Battery canister shall provide an electromagnetic shield attenuation (see 6.3.3) between current densities induced in the interior of the housing and densities on the exterior of the housing equal to or less than attenuation ratios given in Figure 9 over the frequency range of 10 kHz to 100 MHz.

3.3.1.4 Finishes. Protective exterior finishes of the Battery shall be passivated as described in QQ-P-35 for stainless steel.

3.3.1.5 Rubber parts. No article containing natural rubber parts shall be used in the Battery. The use of synthetic rubber materials shall be

confined to O-ring seals and pyrotechnic gas generator fuel and shall meet the requirements of 3.2.3.2.

3.3.1.6 Canister. The canister material shall be 0.046 in minimum thickness stainless steel and shall meet the requirements of QQ-S-766, Grade 300 series.

3.3.1.7 Activation. The Battery shall be activated within 4 s after initiation by a Through Bulkhead Initiator as part of an Ordnance Initiation Set (see 6.2 and 6.3.7).

3.3.1.8 Helium leak rate. The helium leak rate from the canister prior to activation shall be less than 10^{-6} in^3/s at a vacuum chamber pressure of less than 0.002 lb/in^2 absolute.

3.3.1.9 Electrolyte leakage. The Battery shall discharge no visible electrolyte external to the Battery canister prior to and within 1260 s after the start of activation when connected to the load of 3.2.1.3.

3.3.1.10 Welds. Fusion welds shall conform to the requirements of MIL-W-8611 except that Tests for Procedure Certification shall be amended to specify that inspections and tests involving the use of dye penetrants shall not be performed where contamination is a consideration, and radiography need not be performed where weld geometry does not permit, providing visual inspection and macro and micro examination of sample welds is performed. Resistance welding shall be in accordance with MIL-W-6858.

3.3.1.11 Connectors.

3.3.1.11.1 Electrical connectors. Electrical connectors shall be stainless steel, hermetically sealed, and meet the requirements of MIL-C-38999. Connectors shall be selected so that it is physically possible to interconnect one and only one cable by providing keys or aligning pins and by size, location, or type differences, or equivalent means. All connectors shall be clearly labeled in addition to the physical means to prevent improper connection.

3.3.1.11.2 Connector transfer impedance. Connectors shall have a transfer impedance whose magnitude shall not exceed the values shown in Figure 10.

3.3.2 Electromagnetic radiation. This paragraph not applicable to this specification.

3.3.3 Nameplates and product markings. Nameplates and product marking shall be in accordance with MIL-STD-130.

3.3.4 Workmanship. The finished Battery, including all parts and accessories, shall reflect a consistent and uniform appearance. Particular attention shall be paid to cleanliness, neatness, and thoroughness of soldering, wiring, marking of parts of assemblies, welding and brazing, and freedom of parts from foreign material, burrs and sharp edges.

3.3.5 Interchangeability. This paragraph not applicable to this specification.

3.3.6 Safety. The Battery shall preclude or limit personnel injury hazards due to adverse explosive, mechanical, biological, and toxicological effects. The Battery shall be constructed to provide maximum safety to personnel during installation and maintenance. The Battery shall not create a fire hazard, hazardous current leakage, or explosion under any conditions of storage or operation specified herein until more than 1260 s after activation.

3.3.7 Human performance/human engineering. The Battery shall comply with the requirements of MIL-STD-1472 as pertains to Labeling, Anthropometry, and Hazards and Safety Criteria.

3.3.7.1 Anthropometry. The requirements of MIL-STD-1472 shall be referenced to the fifth percentile female and the 95th percentile male.

3.3.7.2 Controls and horizontal push-pull forces. The maximum resistance and force limit values of MIL-STD-1472 shall be reduced to 0.67 of the values specified and shall also apply to human force applications, for example, tool operation, connector mating and demating, etc.

3.3.7.3 Mass limits. The maximum limits specified in MIL-STD-1472 are reduced to 0.67 of the values specified. Where the item must be carried moderate distances, not to exceed 16 ft, the masses shall not exceed 30 lb for one-person or 60 lb for two-person carry.

3.3.7.4 Equipment labels. Labels for equipment shall be engraved or chemically etched. Engraved, staked metal plates may be used.

3.4 Documentation. This paragraph not applicable to this specification.

3.5 Logistics. This paragraph not applicable to this specification.

3.6 Precedence. This paragraph not applicable to this specification.

4. QUALITY ASSURANCE PROVISIONS

4.1 General. Inspections which consist of examination, demonstrations, tests and analyses shall be conducted on the Battery to provide the Air Force with assurance of compliance with the requirements of this specification.

4.1.1 Responsibility for tests. The contractor shall be responsible for the performance of all inspections for the Battery produced in accordance with this specification.

4.1.2 Special tests and examinations. This paragraph is not applicable to this specification.

4.2 Quality conformance inspections. Qualification shall be performed on a battery that is representative of the approved production design. Qualification of the battery to assure compliance with the requirements of Section 3 shall be by examinations, tests, demonstrations, or analyses, as shown in Table I. Definitions of examination, demonstration, test, and analysis are as follows:

a. Examination is an element of inspection consisting of investigation, without the use of special laboratory appliances or procedures, or supplies and services to determine conformance to those specified requirements which can be determined by such investigations. Examination is generally nondestructive and includes, but is not limited to, visual, auditory, olfactory, tactile, gustatory, and other investigations; simple physical manipulation; gauging, and measurement.

b. Test is an element of inspection denoting the determination of the properties or elements of supplies (or components thereof) by technical means, including functional operation and the application of established principles and procedures. The analysis of data derived from test is an integral part of this inspection element, and shall not be confused with 4.2.d.

c. Demonstration is an element of inspection that, although technically a variation of test, differs from 4.2.b by directness of approach in the verification of a requirement(s), and is accomplished in a near service environment without the use of elaborate instrumentaion or special equipment. Thus, operation of a representative configuration item (CI) in, or near its use-environment (for example, ability of a truck to climb a 3300 ft, five percent grade, from standstill in the required time) would be defined as a "demonstration" rather than a "test".

d. Analysis is an element of inspection in the form of study, resulting in data, that is intended to verify a requirement(s) when an examination test, or demonstration cannot feasibly be employed to verify that requirement(s) at the inspection level demanded by this specification. Such data may be comprised of a compilation or interpretation of existing data or design resolutions, or derived from original lower-level inspections, or both.

4.2.1 Inspection conditions. Unless otherwise specified herein, measurement tests shall be made at standard ambient conditions, and test conditions and test tolerances applicable to environmental exposures shall be as specified in 3.2.5.

4.2.2 Engineering test and evaluation. Engineering test and evaluation inspections are inspections performed prior to first flight on engineering model or prototype hardware representative of the flight configuration. Test results may be used directly or extrapolated to form the basis for the analyses in Table I.

4.2.3 Characteristics.

4.2.3.1 Performance. Tests shall be performed as follows:

4.2.3.1.1 Insulation resistance. Apply 500 ± 25 Vdc between any connector pin and the canister prior to activation and measure resistance. Verify for compliance with the requirements of 3.2.1.1.

4.2.3.1.2 Output voltage. Using activated batteries, monitor the terminal of each battery section while the battery sections are discharged in accordance with the load profile of Figures 1 and 2. Verify compliance with the requirements of 3.2.1.2, 3.2.1.2.1 and 3.2.1.2.2.

4.2.3.1.3 Load profile. Monitor load profiles as shown in Figures 1 and 2 during the test of 4.2.3.1.2. Verify for compliance with the requirements of 3.2.1.3.

4.2.3.1.4 Inter-battery isolation. Perform isolation test. Verify compliance with the requirements of 3.2.1.4.

4.2.3.1.5 Leakage current. Apply load profile specified in 3.2.1.3 to the terminals of the activated battery. Verify for compliance with the requirements of 3.2.1.5.

4.2.3.1.6 Reverse current - 76.5V Section. To verify compliance with 3.2.1.6 and subparagraphs, monitor the current flow during the performance of 4.2.3.1.3.

4.2.3.2 Physical characteristics

4.2.3.2.1 Mass properties. A test shall be performed to verify compliance with the requirements of 3.2.2.1. The Battery shall be weighed and the location of the center-of-gravity determined for the nonactivated and activated conditions.

4.2.3.2.2 Dimensions. An examination shall be performed to verify compliance with 3.2.2.2.

4.2.3.3 Reliability

4.2.3.3.1 Launch and flight reliability. An analysis shall be performed to verify compliance with 3.2.3.1.

4.2.3.3.2 Service life. An analysis shall be performed to verify compliance with 3.2.3.2.

4.2.3.4 Maintainability: Removal and replacement. A demonstration shall be performed to verify compliance with 3.2.4.1.

4.2.3.5 Environmental conditions. Perform the tests of 4.2.3.1 after subjection to the methods of exposure that relate to the unpowered environments of 3.2.5. Perform the tests of 4.2.3.1 except 4.2.3.1.1 during and after subjection to the methods of exposure that relate to the powered environments of 3.2.5. Where an analysis is used as the method of exposure, this analysis shall also verify the performance requirements during and after exposure. Verify compliance with the requirements of 3.2.5.

4.2.3.5.1 Temperature. The Battery shall meet the requirements of 4.2.3.10 to verify compliance with 3.2.5.1.1 prior to being subjected to the following temperature tests. The Battery temperature shall be lowered to -58 $\pm$ 2 degrees F and the battery soaked for 24 h. The temperature shall then be raised to 126 $\pm$ 2 degrees F at 10 degrees F per minute (maximum) and the Battery soaked for 24 h. After hot soak, the temperature shall be lowered to 98 $\pm$ 2 degrees F at 10 degrees F per minute maximum and soaked for 8 h. The Battery shall then be activated within 15 minutes and the performance measurements tests of 4.2.3.1.2 through 4.2.3.1.6 shall be accomplished. After the Battery is activated, the temperature shall be raised to a temperature of 135 $\pm$ 2 degrees F at the rate of 10 degrees F per minute. This test shall be repeated for a second Battery except that the temperature shall first be increased to 126 $\pm$ 2 degrees F and soaked for 24 h. The temperature shall then be lowered to -58 $\pm$ 2 degrees F at a rate of 10 degrees F per minute (maximum) and soaked for 24 h. After cold soak, the Battery temperature shall be increased to 47 $\pm$ 2 degrees F at 10 degrees F per minute (maximum) and soaked for 8 hours, and the pressure shall be varied from local ambient to $3.9 \quad 10^{-6}$ lb/in^2. The Battery shall be activated and the performance measurements tests of 4.2.3.1.2 through 4.2.3.1.6 shall be accomplished with the same temperature increase as defined above in the test of the first Battery. Verify that the performance tests of 4.2.3.1.2 through 4.2.3.1.6, as associated with the methods of exposure, are accomplished as specified in 4.2.3.5 (ref 3.2.5.1.2) and perform an analysis to verify performance at 100 degrees F and 45 degrees F as appropriate.

4.2.3.5.2 Humidity. A test shall be performed. The Battery shall be subjected to humidity tests per MIL STD 810, Method 507.1, Procedure I, except the limits of 3.2.5.1.2a and 3.2.5.1.3 shall apply (ref 3.2.5.1.3).

4.2.3.5.3 Fungus (powered and unpowered). An analysis shall be performed (ref 3.2.5.1.4).

4.2.3.5.4 Ozone (basing and pre-flight). An analysis shall be performed (ref 3.2.5.1.5).

4.2.3.5.5 Sand and dust (powered and unpowered). An analysis shall be performed (ref 3.2.5.1.6).

4.2.3.5.6 Corrosive atmosphere (powered and unpowered). An analysis shall be performed (ref 3.2.5.1.7).

4.2.3.5.7 Linear acceleration. Subject one each Battery to the operating limit, steady-state environment of 3.2.5.2.1a.(1) and 3.2.5.2.1a.(2) after activation of the Battery. The performance measurements of 4.2.3.1.2 through 4.2.3.1.6 will then be performed [ref 3.2.5.2.1a.(1) and 3.2.5.2.1a.(2)].

4.2.3.5.8 Angular acceleration. An analysis shall be performed (ref 3.2.5.2.1.b).

4.2.3.5.9 Unpowered preflight mobile shock. The Battery shall be subjected to 50 sawtooth pulse shocks of 1 g amplitude with shape characteristics of 3.2.5.2.2.b and then activated and tested for performance measurements in accordance with 4.2.3.1.2 through 4.2.3.1.6 (ref 3.2.5.2.2b).

4.2.3.5.10 Powered shock. Subject the Battery to the shock environment of Figure 5 in three orthogonal axes simultaneously except that the amplitude shall be increased by 3 1/2 dB and perform the tests of 4.2.3.1.2 through 4.2.3.1.6 (ref 3.2.5.2.2c).

4.2.3.5.11 Unpowered vibration. Subject the Battery to the random vibration of Figure 6 except the vibration level shall be 1.28 grms and the time 20 hours with the g loading applied in the axis perpendicular to the Battery connector surface. Activate the Battery and perform the tests of 4.2.3.1.2 through 4.2.3.1.6 (ref. 3.2.5.2.3a).

4.2.3.5.12 Powered vibration. Subject each of the orthogonal axes of the activated battery to the environment of 3.2.5.2.3b. except the vibration amplitude shall be increased by 3 1/2 dB for a time duration of 1 minute. Perform the tests of 4.2.3.1.2 through 4.2.3.1.6 for each axis (ref 3.2.5.2.3b).

4.2.3.5.13 Acoustic. An analysis shall be performed (ref 3.2.5.2.4).

4.2.3.5.14 Nuclear radiation and EMP. An analysis shall be performed (ref 3.2.5.3).

4.2.3.5.15 Pressure. An analysis shall be performed to verify compliance with 3.2.5.1.1.

4.2.3.6 Transportability. An analysis shall be performed (ref 3.2.6).

interface mounting surface will be measured at ambient conditions. The requirements of 3.3.1.2b shall be verified by examinations.

4.2.3.7.2 Shielding. An analysis using test data shall be performed (ref 3.3.1.3).

4.2.3.8 Activation. A test shall be performed to verify compliance with 3.3.1.7.

4.2.3.9 Connector transfer impedance. An analysis using test data shall be performed (ref 3.3.1.11.2).

4.2.3.10 Helium leak rate. A test shall be performed in accordance with the test methods of BB-H-1186 to verify compliance with 3.3.1.8.

4.2.3.11 Safety. An analysis shall be performed (ref 3.3.6).

4.2.3.12 Human performance/human engineering. An analysis shall be performed (ref 3.3.7).

5. PREPARATION FOR DELIVERY

This section not applicable.

6. NOTES

The paragraphs in this section are for information purposes only and are not to be construed as amending or supplementing any other portion of this specification.

6.1 Intended use. This Battery is intended to provide power for operational electronic equipment in the Missile X Guidance and Control subsystem.

6.2 Interfacing equipment

Nomenclature	CI No	Specification No	Date
MX Missile Guidance Control Set (MGCS)	0041031	S-M-X-41031	9 May 80
MX Ordnance Initiation Set (OIS)	0041027	S-M-X-41027	17 Apr 80
MX Stage IV	0041016	S-M-X-41016	1 Apr 80
MX Cable Set, Stage IV	0041035	S-M-X-41035	9 May 80

6.3 Definitions

6.3.1 Launch and flight reliability. The probability that a Battery that is indicated as available for commitment to the launch sequence will successfully perform its specified functions during the launch and flight sequence.

6.3.2 Service life. Service life is the sum of the operational (maximum of 21 minutes) and non-operational time of the Battery. The end-of-service life occurs 21 minutes after Battery activation.

6.3.3 Electromagnetic shield attenuation. Electromagnetic shield attenuation is defined as the ratio of the current density on an interior conductive surface mounted parallel to the current density on exterior Battery canister surface which arises due to a current density on the Battery canister surface. This is illustrated in Figure 11.

6.3.4 Mass units. 1 slug = 32.17404 pounds-mass.

6.3.5 Longitudinal axis. The longitudinal axis is an axis parallel to the missile roll axis.

6.3.6 Deleted.

6.3.7 Activation. For the purposes of this specification, activation is defined as the time at which the battery terminal voltage first attains a value within the acceptable limits as defined in 3.2.1.2. This point in time is "time zero."

6.3.8 Negatively proportional. The phrase negatively proportional refers to the phenomenon in which the battery terminal voltage varies with changes in load current in such a manner that increases in current cause decreases in terminal voltage and vice-versa.

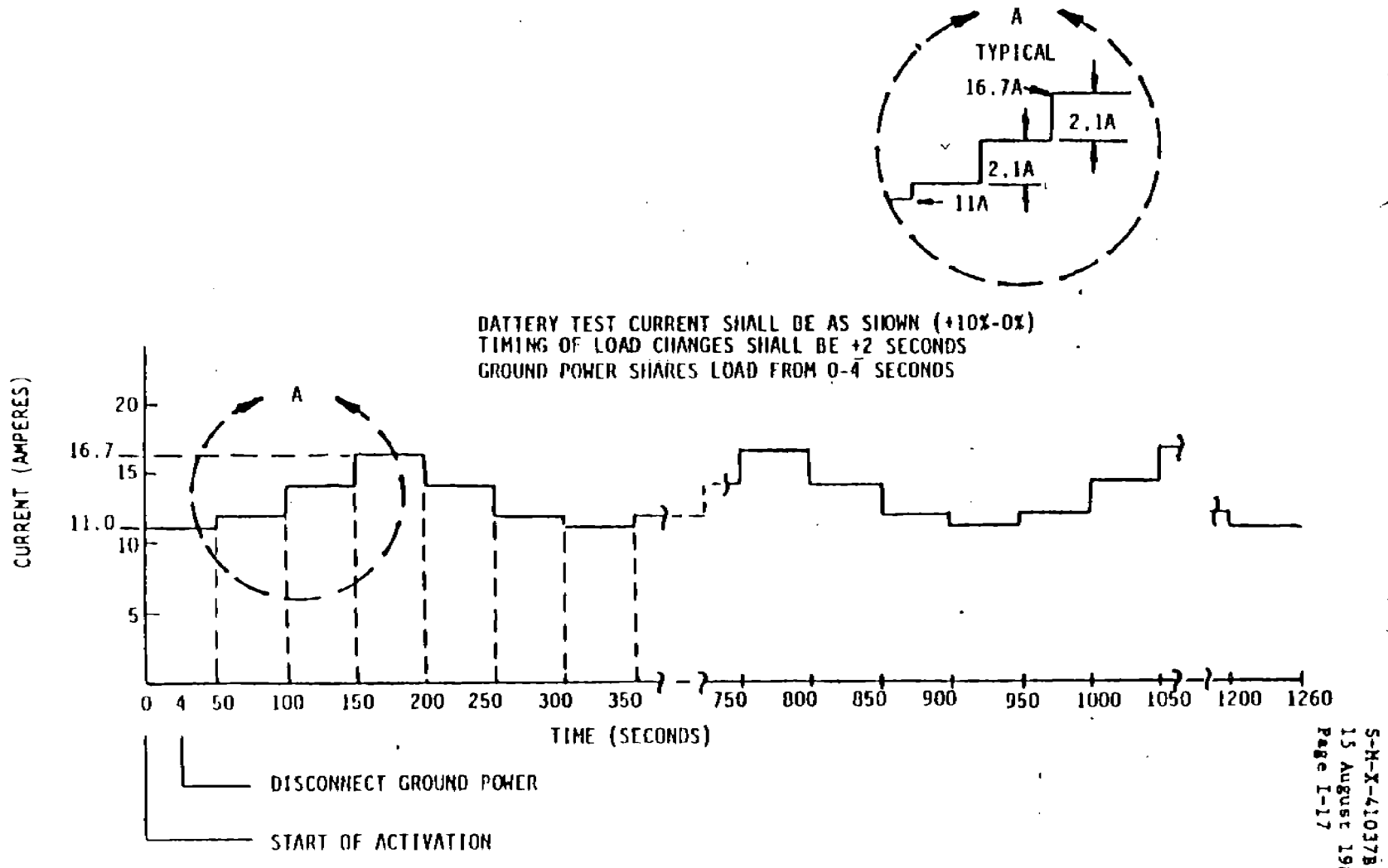
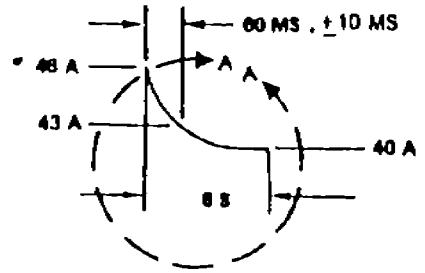
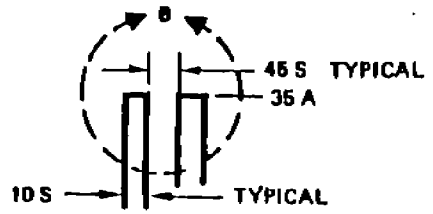


Figure 1. 76.5 Volt Load Profile



TYPICAL 12 PLACES



* MAXIMUM CURRENT AMPLITUDE AT MINIMUM TERMINAL VOLTAGE
BATTERY TEST CURRENT SHALL BE AS SHOWN (+10%, – 0%)
TIMING OF LOAD CHANGES SHALL BE ±2 SECONDS
GROUND POWER SHARES LOAD FROM 0 TO 4 SECONDS AFTER INITIATION

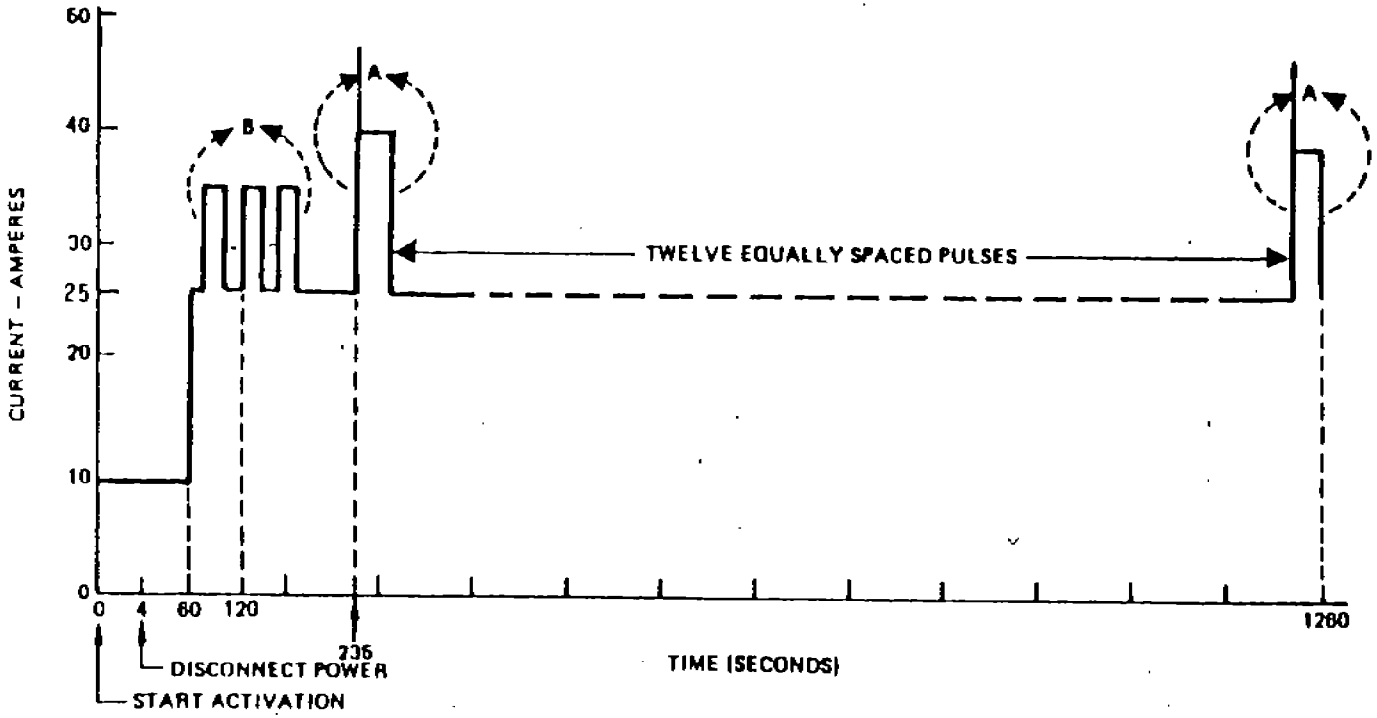
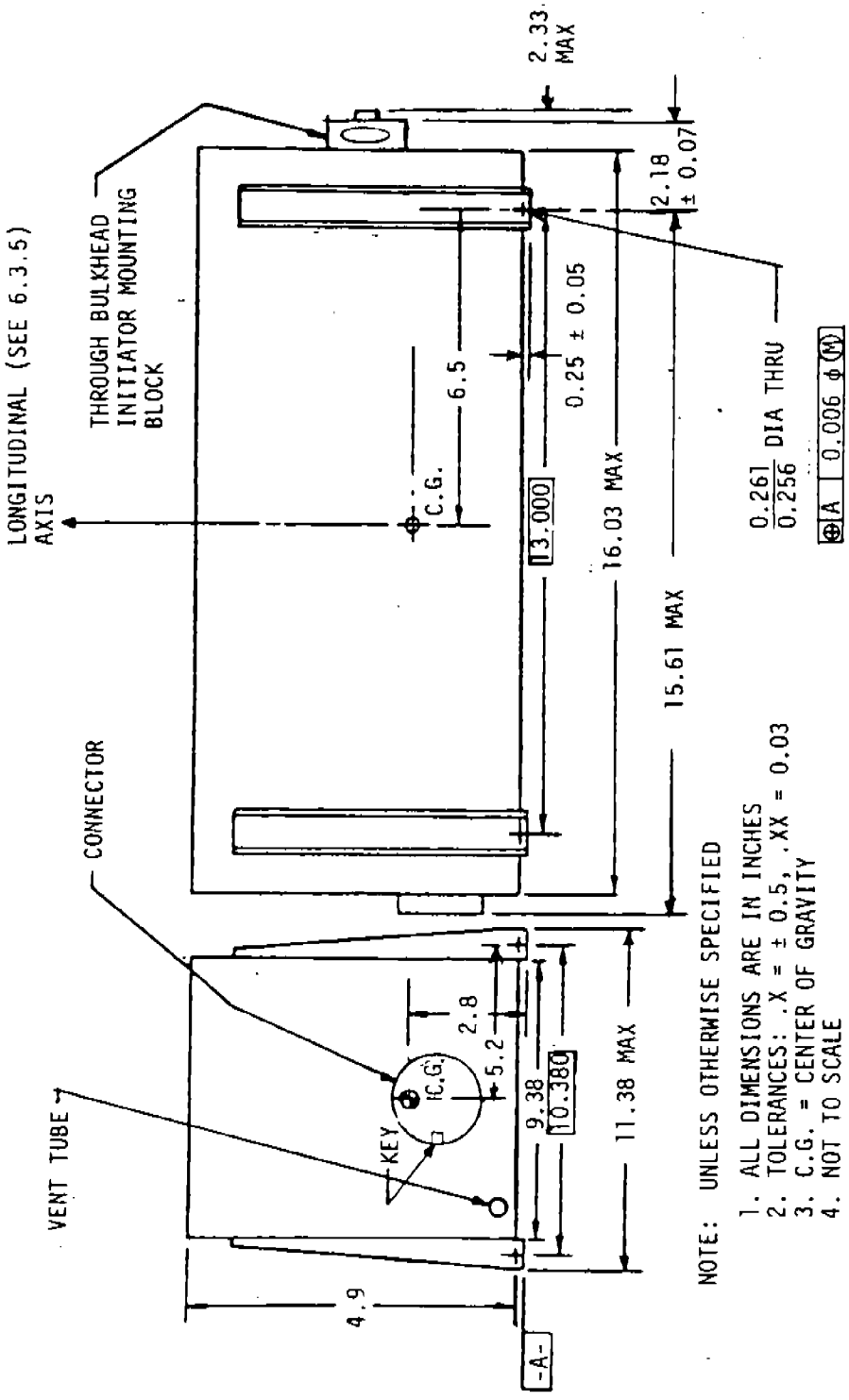


Figure 2. 31.0 Volt Load Profile



NOTE: UNLESS OTHERWISE SPECIFIED

1. ALL DIMENSIONS ARE IN INCHES
2. TOLERANCES: .X = ± 0.5, .XX = 0.03
3. C.G. = CENTER OF GRAVITY
4. NOT TO SCALE

Figure 3. Battery Dimensions

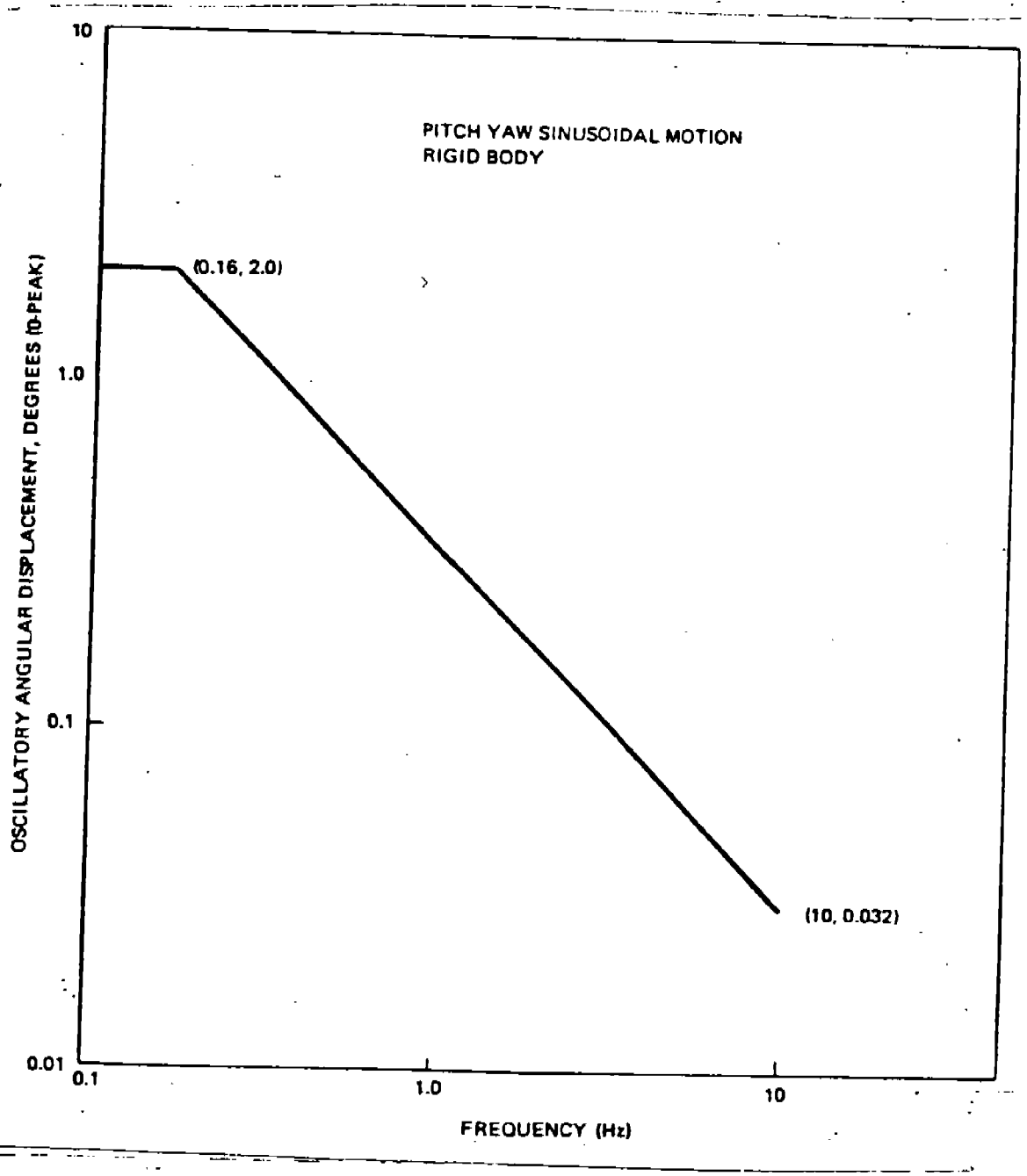


Figure 4. Oscillatory Angular Motion During Powered Flight

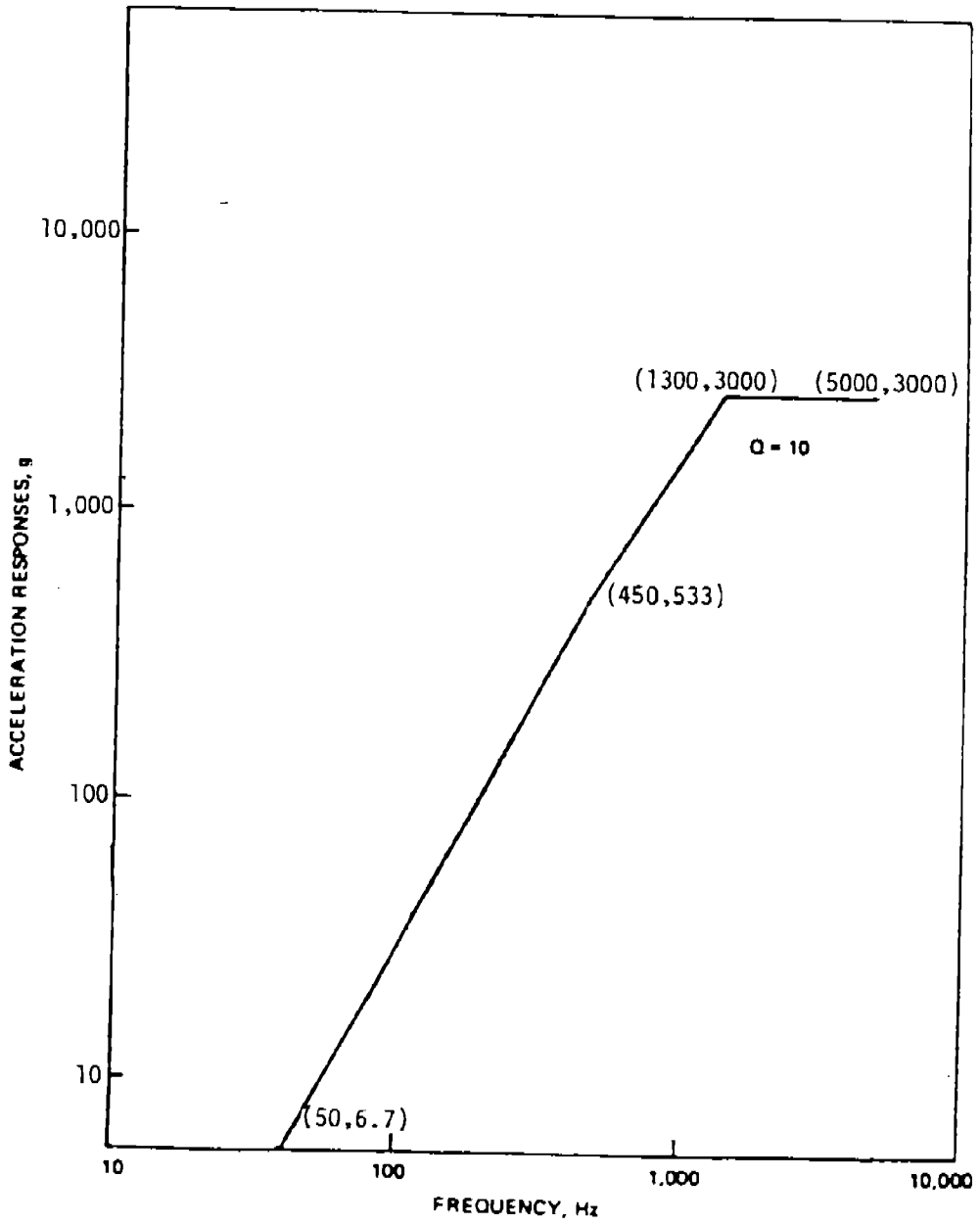


Figure 5. Powered Flight Shock Spectra

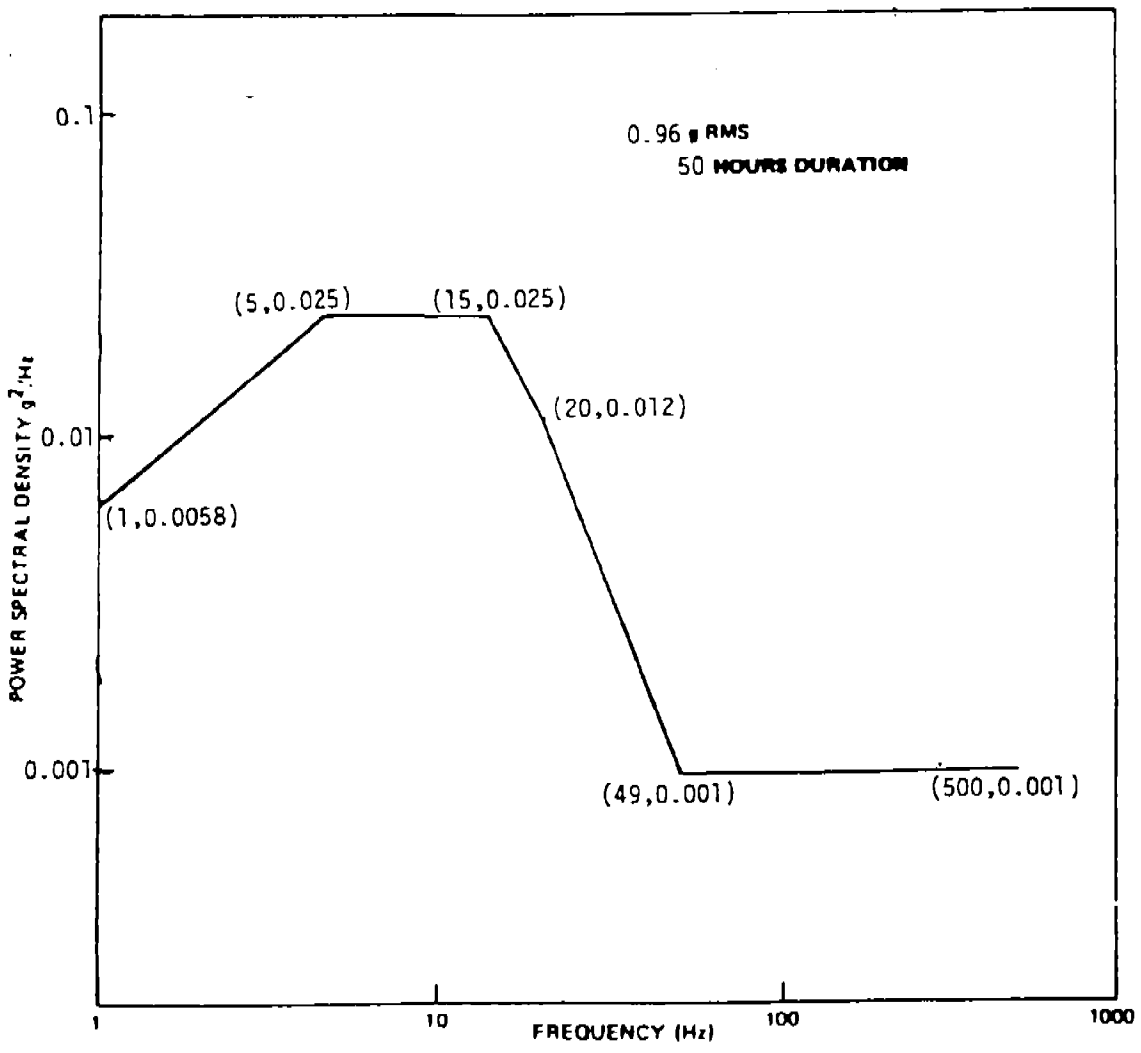


Figure 6. Unpowered Vibration

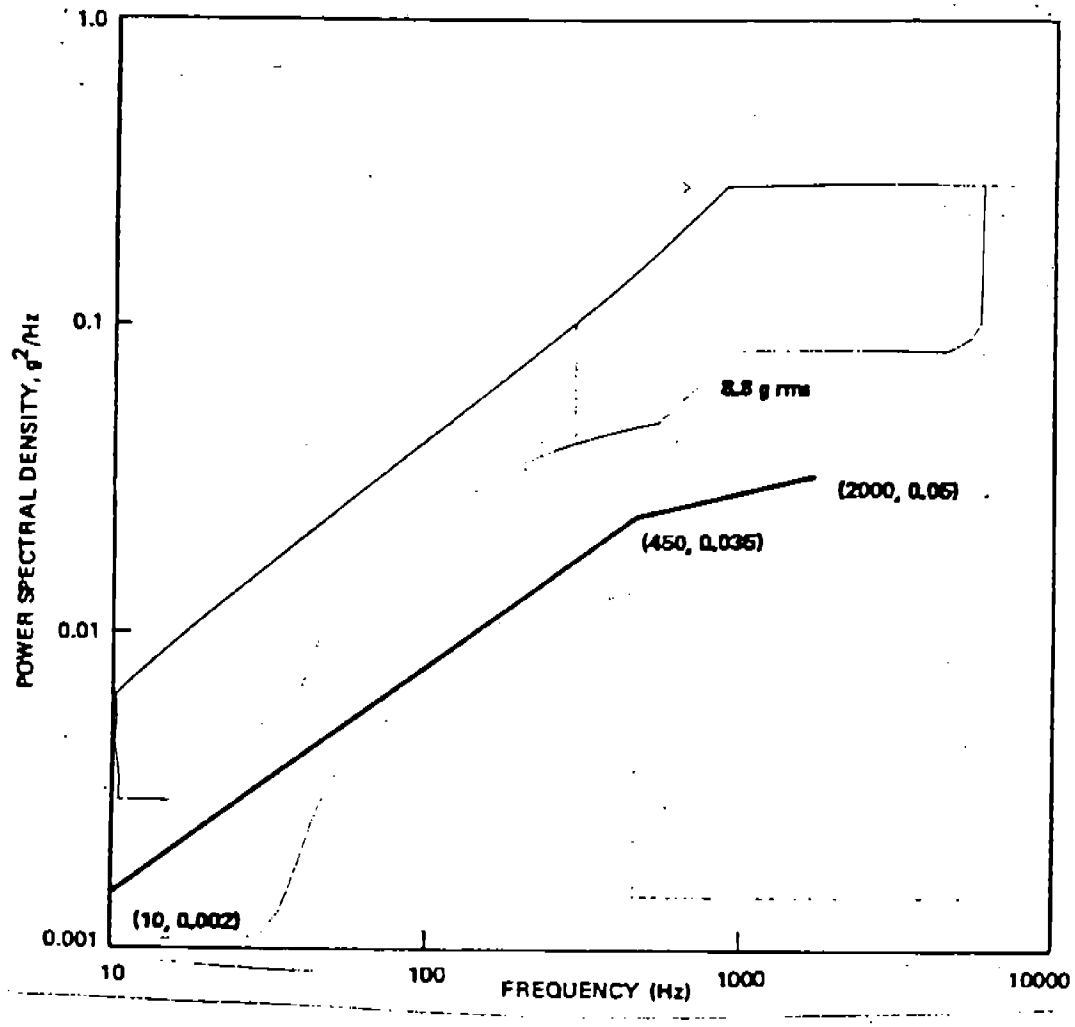


Figure 7. Powered Random Vibration

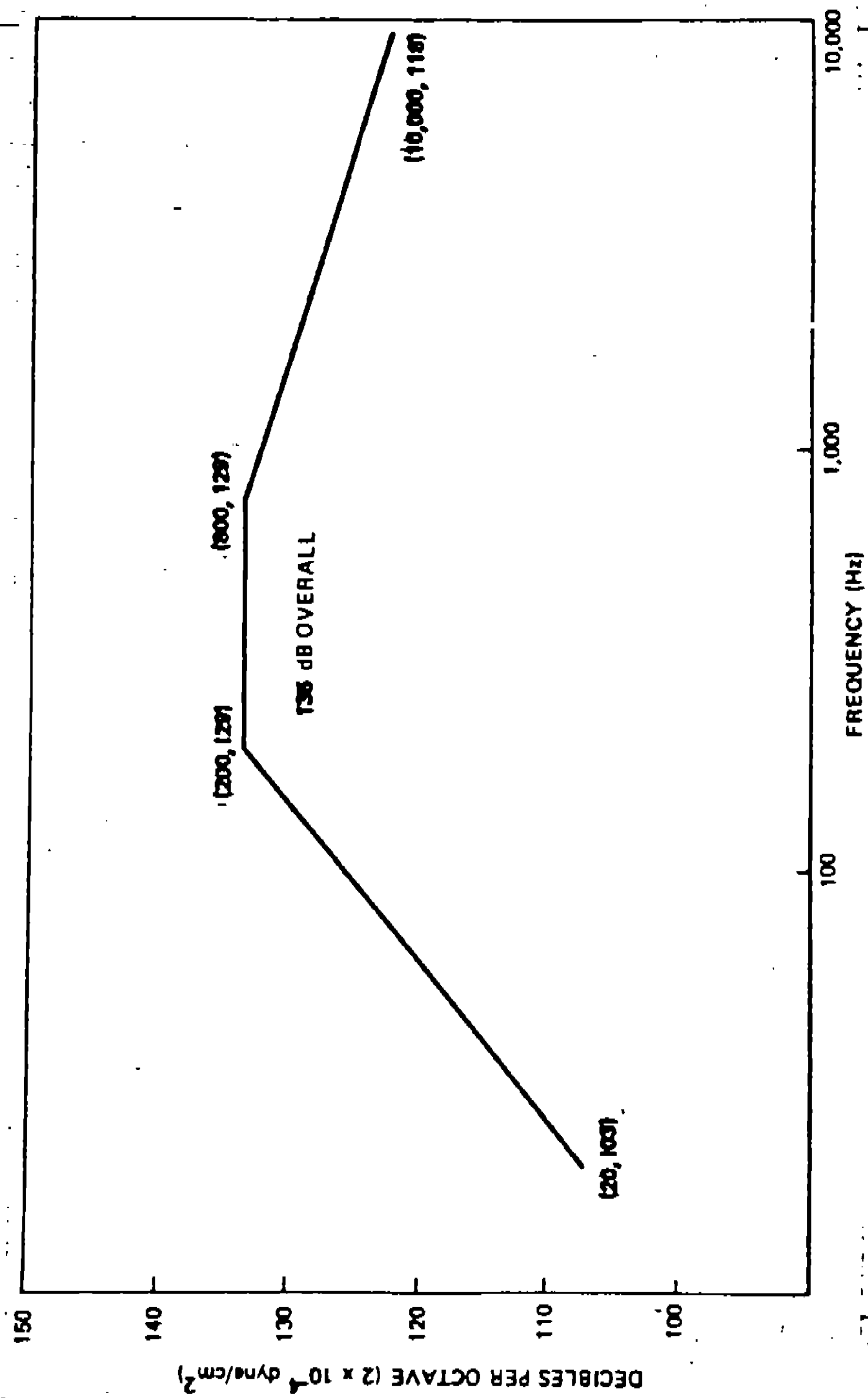


Figure 8. Acoustic Field (PBV)

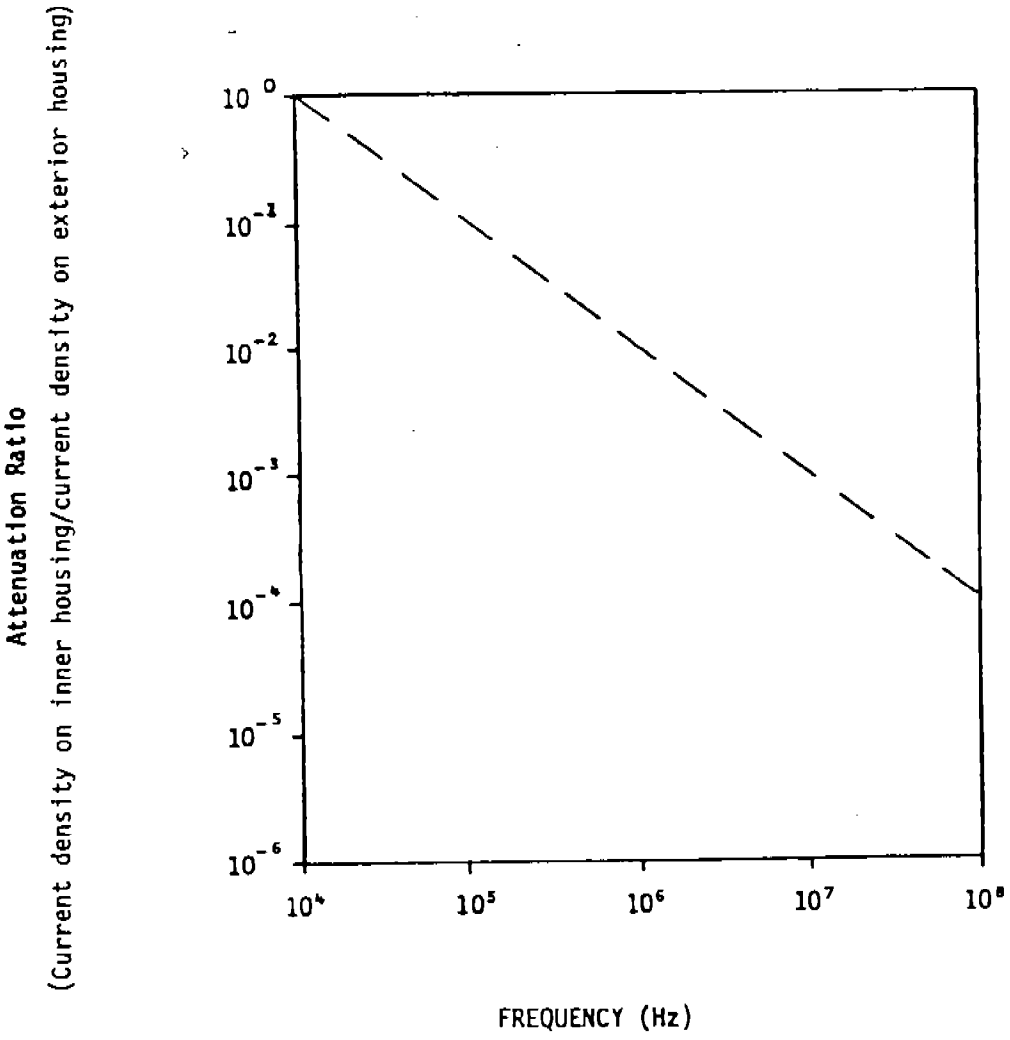


Figure 9. Battery Canister Electromagnetic Shield Requirement

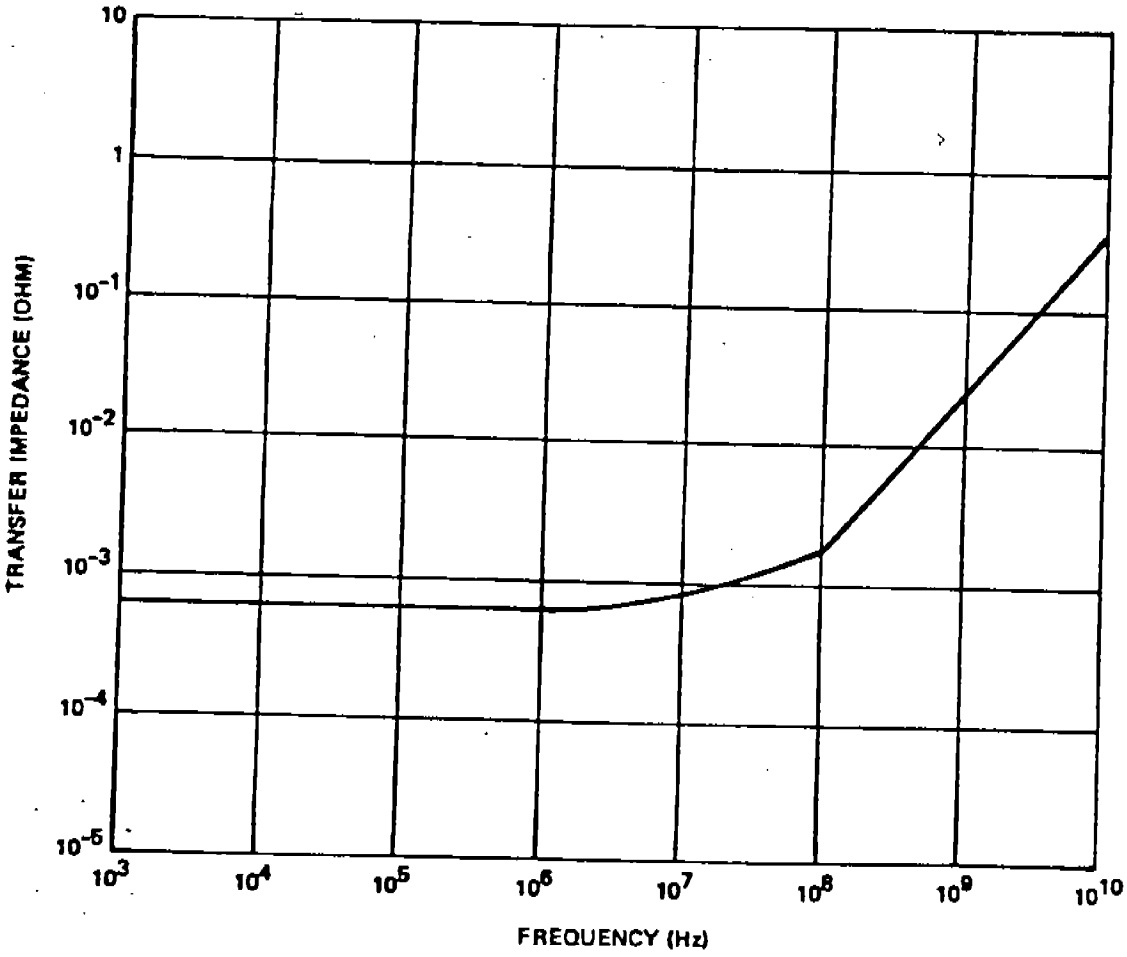


Figure 10. Circular Connector Transfer Impedance, Mated

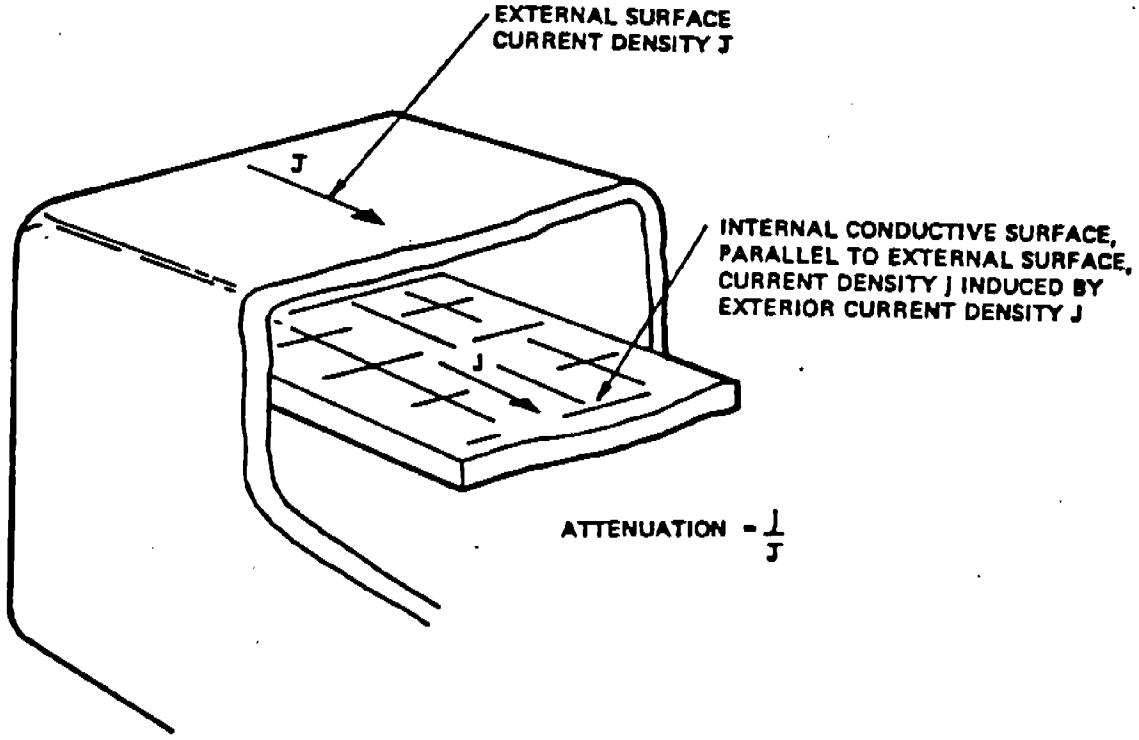


Figure 11. Electromagnetic Case Attenuation Definition

Table I. Quality Conformance Inspection Matrix

Requirement		Verification Method			
Title	Paragraph	Analysis	Test	Exam	Demo
Insulation Resistance	3.2.1.1		X		
Output Voltage	3.2.1.2		X		
Load Profile	3.2.1.3		X		
Interbattery Isolation	3.2.1.4		X		
Reverse Current - 76.5V Sect.	3.2.1.6		X		
Leakage Current	3.2.1.5		X		
Mass Properties	3.2.2.1	X	X		
Dimensions	3.2.2.2			X	
Reliability	3.2.3	X			
Maintainability	3.2.4				X
Pressure	3.2.5.1.1	X			
Temperature	3.2.5.1.2		X		
Humidity	3.2.5.1.3		X		
Fungus	3.2.5.1.4	X			
Ozone	3.2.5.1.5	X			
Sand and Dust	3.2.5.1.6	X			
Corrosive Atmosphere	3.2.5.1.7	X			
Acceleration (Linear)	3.2.5.2.1.a		X		
Acceleration (Angular)	3.2.5.2.1.b	X			
Shock (Unpowered)	3.2.5.2.2.b		X		
Shock - Powered (Flight)	3.2.5.2.2.c		X		
Vibration - Unpowered	3.2.5.2.3.a		X		
Vibration - Powered (Flight)	3.2.5.2.3.b		X		
Acoustic	3.2.5.2.4	X			
Nuclear Radiation	3.2.5.3	X			
Transportability	3.2.6	X			
Design and Construction	3.3			X	

Table I. Quality Conformance Inspection Matrix (Continued)

Requirement		Verification Method			
Title	Paragraph	Analysis	Test	Exam	Demo
Bonding	3.3.1.2		X	X	
Shielding	3.3.1.3	X			
Activation	3.3.1.7		X		
Helium Leak Rate	3.3.1.8		X		
Connector Transfer Impedance	3.3.1.11.2	X			
Safety	3.3.6	X			
Human Performance/ Human Engineering	3.3.7	X			

SPECIFICATION CHANGE NOTICE ASSIGNMENT LOG

CONTRACTOR: AU

FIGURE A/MRCN: 41037

5-113-41037 PART II

SCN NO	ECP NO	MIP NO	ECS NO	CMOD	CCBD A	CCBD D	ADCN NO	U	C	SCD NO	REMARKS
1	83-1										Dawg SCN 16 JAN 86
2	AU 157-1										

PK

II

Electronics

Battery

DO-ALC FORM JUN 70 402

SPECIFICATION CHANGE NOTICE (SCN)

1. DATE (YYMMDD)	Form Approved OMB No. 0704-0188
871105	

PLEASE DO NOT RETURN YOUR COMPLETED FORM TO EITHER OF THESE ADDRESSES. RETURN COMPLETED FORM TO THE GOVERNMENT ISSUING CONTRACTING OFFICER FOR THE CONTRACT/PROCURING ACTIVITY NUMBER LISTED IN ITEM 2 OF THIS FORM.

2. PROCURING ACTIVITY NO.	
3. DODAAC	

4. ORIGINATOR

a. TYPED NAME *(First, Middle Initial, Last)*

Rockwell International Corporation

b. ADDRESS *(Street, City, State, Zip Code)*

3370 Miraloma Ave. Anaheim Ca. 92803

5. SCN TYPE

[ ] PROPOSED [X] APPROVED

6. CAGE CODE	7. SPEC. NO.
94756	S-M-X-41037 PT II
8. CAGE CODE	**9. SCN NO.**
94756	2

10. SYSTEM DESIGNATION	11. RELATED ECP NO.	12. CONTRACT NO.	13. CONTRACTUAL AUTHORIZATION
WS-118	AU 157-1	F04704-84-C-0025	BMO PKAD 11-17-87 CCBD 11-5-87

14. CONFIGURATION ITEM NOMENCLATURE	15. EFFECTIVITY
Electronics Battery	S/N EBD0039 and subs

This notice informs recipients that the specification identified by the number (and revision letter) shown in Item 7 has been changed. The pages changed by this SCN are those furnished herewith and carry the approval date of the related ECP listed in Item 11. The pages of the page numbers and dates listed in Items 16 and 17, combined with non-listed pages of the original issue of the revision shown in Item 7, constitute the current approved version of this specification.

16. PAGES AFFECTED BY THIS SCN PAGE(S) a.	TYPE OF CHANGE* b.	APPROVAL DATE (YYMMDD) c.
II-3	S	5- Nov-1987

17. SUMMARY OF PREVIOUSLY CHANGES PAGES

SCN NO. a.	RELATED ECP NO. b.	PAGE(S) c.	DATE SUBMITTED (YYMMDD) d.	TYPE OF CHANGE* e.	APPROVAL DATE (YYMMDD) c.
1	83-1	II-i, II-ii, II-iii, II-2, II-6, II-7, II-8 II-17		S A	16 Jan 1986

* "S" indicates supersedes earlier page. "A" indicates added page. "D" indicates deletion.

18.a. GOVERNMENT ACTIVITY	c. SIGNATURE	d. DATE SIGNED (YYMMDD)
b. TYPED NAME *(First, Middle Initial, Last)*		

DD Form 1696, APR 92 *Previous editions are obsolete.*

S-M-X-41037
FSCM 94756
PART II OF TWO PARTS
8 August 1985

CRITICAL ITEM PRODUCT FABRICATION SPECIFICATION

FOR

PEACEKEEPER ELECTRONIC BATTERY

CI 0041037

Authenticated by Ballistic Missile Office Configuration

Control (CCB) Directive dated 8 August 1985

CONTENTS

CONTENTS

LIST OF FIGURES

LIST OF TABLES

1. SCOPE

1.1 This specification establishes the requirements for manufacture and acceptance of the Peacekeeper Electronic Battery critical item (CI 0041037) hereinafter referred to as the Battery.

2. APPLICABLE DOCUMENTS

2.1 Government documents. The following documents of the exact issue shown form a part of this specification to the extent specified herein. In the event of conflict between the contents of this specification and the listed documents, the contents of this specification shall be considered to be superseding requirements.

SPECIFICATIONS

Federal

PPP-B-636H 17 July 1973	Box, Shipping, Fiberboard

Military

MIL-P-116H 21 November 1979 01 December 1980	Preservation-Packaging, Methods of

STANDARDS

Military

MIL-STD-129H 1 July 1980 Notice 1 Notice 2	Marking for Shipment or Storage
MIL-STD-794E 16 July 1982	Parts and Equipment, Procedures for Packaging and Packing of
MIL-STD-202F 1 April 1981 Notice 1 29 Jan 81 Notice 2 27 Jan 82 Notice 3 8 Jul 82 Notice 4 21 Oct 82	Test Methods for Electronic and Electrical Component Parts

Federal

49 CFR	Title 49 of the Code of Federal Regulations

Air Force

SAMSO-STD-77-5 21 July 77	Classification of Characteristics for the MX Aerospace Vehicle Equipment

2.2 Non-government documents. The following documents of the exact issue shown form a part of this specification to the extent specified herein. In the event of conflict between the contents of this specification and the listed documents, the contents of this specification shall be considered to be superseding requirements.

DRAWINGS

Yardney Electric Corporation

203715* Rev C	Battery, Primary, Remotely Activated, Assembly, Model P471

*It is intended that later issues of this drawing replace the issue shown, provided that such later issues reflect only Class II changes as defined in DOD-STD-480.

(Copies of documents required by suppliers in connection with specified procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

3. REQUIREMENTS

3.1 Item definition. The Battery supplies 76.5 volts direct current (Vdc) power for the airborne Inertial Measurement Unit and 31.0 Vdc for the other airborne electronic devices. It consists of two groups of cells, activation mechanism, canister, and a hermetically sealed connector. The Battery is a primary, automatically activated, silver oxide - zinc type and activation will be initiated by a Through Bulkhead Initiator (TBI) which is part of a MX Ordnance Initiation Set (CI 0041027).

3.2 Characteristics.

3.2.1 Performance.

3.2.1.1 Insulation resistance. The insulation resistance between the connector pins and the Battery canister shall exceed 1 megohm.

3.2.1.2 Output voltage. The Battery shall output the voltages specified below when discharged to the load profile of the figures listed below for a period of 1260 s after activation (see 6.3):

Battery Section	Voltage (Vdc)	Tolerance (Vdc)	Applicable Load Profile
High Voltage	76.5	+5.0 -4.0	figure 1 (0 - 60 s)
		+3.5 -4.0	figure 1 (60 - 1260 s)
Low Voltage	31.0	+3.5 -1.8	figure 2 (0 - 60 s)
	31.0	+1.8 -1.8	figure 2 (60 - 1260 s)

3.2.1.2.1 Transient voltage. The Battery shall exhibit no transient voltages greater than 600 millivolts (mV) due to load current changes within the frequency range of 3 kiloHertz (kHz) to 10 kHz in the 76.5 volt section.

3.2.1.2.2 Voltage deviations. There shall be no erratic voltage output, as evidenced by terminal voltage changes of more than 0.5 V in less than 1.0s, independent of voltage changes negatively proportional (see 6.4) to changes in discharge current from 0 to 1260 s after start of activation.

3.2.1.3 Load profile. From 0 to 1260 s after activation, the load profiles shall be as shown in figures 1 and 2.

3.2.1.4 Interbattery isolation. The electrical isolation between the 76.5 V battery section and the 31.0 V battery section shall be 40 decibels (dB) minimum.

3.2.1.5 Leakage current. Within 1260 s after activation, the leakage current from the negative terminals to the Battery canister shall not exceed 10 milliamperes (mA) when the load profile of 3.2.1.3 is applied.

3.2.1.6 Reverse current - 76.5 V section. During activation, conduction of current in the reverse direction (positive to negative terminal internal to the battery) shall not be greater than 4.0 A through the 76.5 V section of the battery.

3.2.1.6.1 Rate of changes. The reverse current rate of change shall not exceed 40 amperes per second.

3.2.1.6.2 High current period. Reverse current exceeding 1.0 ampere shall be limited to a period of 500 milliseconds.

3.2.2 Environmental conditions. The Battery shall meet the performance requirements specified in table II after exposure to the temperatures of 3.2.2.1 as identified in table II.

3.2.2.1 Temperature (powered, preflight). The powered, preflight temperature environment for the Battery shall be 45 to 100 degrees F.

3.3 Design and construction.

3.3.1 Production drawings. The Battery shall be fabricated and assembled in accordance with drawing and part number 203715, and all data assembled thereunder.

3.3.2 Standards of manufacture. The standards and processes required for the manufacture of the Battery shall be as defined by the production drawings of 3.3.1.

3.3.3 Workmanship. The finished Battery, including all parts and accessories, shall reflect a consistent and uniform appearance. Particular attention shall be paid to cleanliness, neatness, and thoroughness of soldering, wiring, marking of parts of assemblies, welding and brazing, and freedom of parts from foreign material, burrs, and sharp edges.

3.3.4 Activation. The Battery shall be activated within 4 s after initiation by a TBI (ref 3.1). Activation is attained when the Battery voltage first meets the requirements 3.2.1.2.

3.3.5 Helium leak rate. The helium leak rate from the Battery canister prior to activation shall be less than 10^{-6} cubic inches per second (in^3/s) at a vacuum chamber pressure of less than 0.002 pounds per square inch absolute (lb/in^2 abs).

3.3.6 Electrolyte leakage. The Battery shall discharge no electrolyte external to the Battery canister prior to and within 1260 s after activation when connected to the load of 3.2.1.3.

3.3.7 Mass properties. The weight of the Battery shall not exceed 43.0 pounds-mass, and the center of gravity shall be as specified in figure 3.

4. QUALITY ASSURANCE PROVISIONS

4.1 General. Inspections of the Battery shall be conducted to verify the requirements of sections 3 and 5 herein. Each acceptance requirement shall be verified by one or more of the elements of inspection defined below.

a. Examination. Examination is an element of inspection consisting of investigation, without the use of special laboratory appliances or procedures, to determine compliance with requirements. Examination is generally nondestructive and includes (but is not limited to) visual inspection, simple physical manipulation, gauging, and measurement. Examination may involve comparison of a physical product to a requirement/standard in the form of a drawing, or other definitive criteria.

b. Demonstration. Demonstration is an element of inspection that is limited to readily observable functional operation to determine compliance with requirements. This element of inspection does not require the use of special equipment or sophisticated instrumentation.

c. Test. Test is an element of inspection that employs technical means including (but not limited to) the evaluation of functional characteristics by use of special equipment or instrumentation, simulation techniques, and the application of established principles and procedures to determine compliance with requirements. The analysis of data derived from test is an integral part of this inspection element.

4.1.1 Responsibility of inspection. The contractor shall be responsible for the performance of all inspections specified herein. Testing shall be conducted at the contractor facility or the facilities of contractor choice with the approval of the procuring activity. The procuring activity reserves the right to witness, or separately perform, any of the inspections set forth herein.

4.1.2 Special tests and examinations. Not applicable

4.1.3 Classification of characteristics. Classification of characteristics (COC) as defined in SAMSO-STD-77-5 are as shown in Table III. These characteristics are identified as follows:

a. Critical characteristics (CC)
b. Major characteristics (MC)

4.2 Quality conformance inspections.

4.2.1 Acceptance inspections. Unless otherwise specified herein, all acceptance inspections shall be made at ambient conditions. Acceptance inspections shall consist of individual inspections and sampling inspections as specified in 4.2.1.1 and 4.2.1.2 below.

4.2.1.1 Individual tests. Each Battery produced shall be subjected to the individual tests specified in table I.

4.2.1.2 Sampling tests. After being subjected to the individual tests of 4.2.1.1, two out of each lot of seven to ten Batteries and one out of each lot of two to six Batteries shall be selected at random and subjected to the tests of table II.

4.2.2 Characteristics.

4.2.2.1 Performance.

4.2.2.1.1 Insulation resistance. To verify compliance with 3.2.1.1, measure the resistance between each negative pin and the connector shell, and between each positive pin and the connector shell with a voltage of 500 $\pm$ 25 V applied.

4.2.2.1.2 Output voltage. To verify compliance with 3.2.1.2 and subparagraphs, activate the Battery and measure the terminal voltage for 1260 seconds minimum with the load applied as defined in 4.2.2.1.3 using a digital recorder, an oscilloscope and/or an oscillograph recorder.

4.2.2.1.3 Load profile. To verify compliance with 3.2.1.3, apply the load specified in figure 1 between the negative and positive pins of the 76.5 V section of the Battery, apply the load specified in figure 2 between the negative and positive pins of the 31.0 V section of the Battery, activate the Battery and measure the currents of both sections.

4.2.2.1.4 Interbattery isolation. To verify compliance with 3.2.1.4, connect the battery as shown in Figure 4 and measure the current through each load shunt resistor. Current variations, concurrent in both load shunts and not associated with planned load current changes, shall not exceed the observed normal load current at that time divided by 100. If the interbattery current exceeds the acceptable limit determine the following:

(a) Calculate the maximum internal impedance of the high voltage section by dividing the maximum terminal voltage change by the causative current change in 4.2.2.1.2.

(b) Multiply the measured interbattery current by the maximum calculated internal impedance. The resulting calculated voltage when added to the measured maximum voltage change shall not exceed 0.6 V.

4.2.2.1.5 Leakage current. To verify compliance with 3.2.1.5, measure the current flow between the negative pins of the Battery and the Battery canister after Battery activiation for a period of 1260 s minimum. (See Figure 4)

4.2.2.1.6 Reverse current - 76.5 V section. To verify compliance with 3.2.1.6 and subparagraphs, monitor the current flow during the performance of 4.2.2.1.3.

4.2.2.2 Environmental conditions. To verify compliance with 3.2.2 and 3.2.2.1, the first destructively tested Battery of each lot shall be temperature soaked at 47 ± 2 degrees F for 8 hours (h) minimum prior to activation and testing in accordance with table II. The second destructively tested Battery (if required) of each lot shall be temperature soaked at 98 ± 2 degrees F for 8 h minimum prior to activation and testing in accordance with table II. Battery temperature shall be recorded prior to testing and after testing an analysis shall be performed to verify compliance with 3.2.1.2 at 45 degrees F and 100 degrees F as appropriate for each test.

4.2.2.3 Design and construction.

4.2.2.3.1 Production drawings. Examine each Battery for compliance with the requirements of 3.3.1.

4.2.2.3.2 Standards of manufacture. This requirement shall be verified in conjunction with verification of the requirements of 3.3.1 (ref 3.3.2).

4.2.2.3.3 Workmanship. Examine each Battery for compliance with the requirements of 3.3.3.

4.2.2.3.4 Activation. To verify compliance with 3.3.4, each Battery tested in accordance with the requirements of table II shall be initiated by a single TBI and the time to activation shall be measured.

4.2.2.3.5 Helium leak rate. To verify compliance with 3.3.5, each Battery shall be tested in accordance with the test methods of MIL-STD-202, Method 112, Procedure III.A.

4.2.2.3.6 Electrolyte leakage. Each Battery tested in accordance with table I and table II shall be examined prior to and during the period from activation to 1260 s thereafter to verify compliance with 3.3.6.

4.2.2.3.7 Mass properties. To verify compliance with 3.3.7, weigh the Battery and determine the location of the center of graviy of a non-activated Battery.

4.3 Preservation, packaging, packing and marking for shipment. The requirements of 5.1 through 5.4 shall be verified by examination.

5. PREPARATION FOR DELIVERY

5.1 Preservation and Packaging. Preservation and packaging shall be level B in accordance with MIL-STD-794.

5.1.1 Cleaning and drying. The Batteries shall be cleaned in accordance with method C-1 of MIL-P-116.

5.1.2 Unit packaging. The Battery shall be packaged one each in accordance with method III of MIL-P-116.

5.2 Packing. Packing shall be level B as follows:

a. The Batteries shall be packaged as specified herein and packed in containers conforming to PPP-B-636. The shipping container shall be closed, sealed and strapped in accordance with the Appendix to PPP-B-636.

b. Shipping containers shall be capable of stacking and supporting superimposed loads during shipment and storage without damage to the container or contents, in accordance with MIL-P-116.

5.3 Marking.

5.3.1 Unit container. Unit containers shall be marked, as a minimum, with the information specified as follows.

Battery Power Supply
Manufacturer Lot Number
Manufacturer Part Number
Date of Manufacture
Serial Number

Shipping & Storage Temperature Limits:
Preferred 32 degrees F to 100 degrees F, Maximum -58 degrees F to 126 degrees F

5.3.2 Shipping container. The shipping container shall be durably and legibly marked in accordance with MIL-STD-129.

5.3.2.1 DOT Exemption. The shipping container shall also be marked as follows:

Battery, Electric, Storage, Wet, Non-Spillable Type
DOT Exemption No. SA-820504

5.4 Other requirements.

5.4.1 Dangerous and hazardous material. In addition to the requirements specified above, the packaging, packing, marking, and labeling shall comply with applicable carrier rules and regulations, specifically, the Code of Federal Regulations, 49CFR.

5.4.2 Connector, vent tube and TBI ports caps. A plastic, protective cap shall be provided for the Battery vent tube and TBI ports during shipment and storage.

6. NOTES

6.1 Intended use. The Battery is intended to provide power for operational electronic equipment in the Peacekeeper Guidance and Control subsystem.

6.2 Ordering data. Procurement documents should specify the following:

a. Title, number, and date of this specification.

b. Nomenclature and part number as designated in 3.3.1 of this specification.

c. Stock number and serialization requirements, as applicable.

d. Level of preservation, packaging, and packing as defined in section 5 of this specification.

The Part I specification must be supplied and utilized for procurement purposes.

6.3 Activation. For the purpose of this specification, activation is defined as the time at which the Battery terminal voltage first attains a value within the acceptable limits as defined in 3.2.1.2. This point in time is "time zero."

6.4 Negatively proportional. The phrase negatively proportional refers to the phenomenon in which the battery terminal voltage varies with changes in load current in such a manner that increases in current cause decreases in terminal voltage and vice versa.

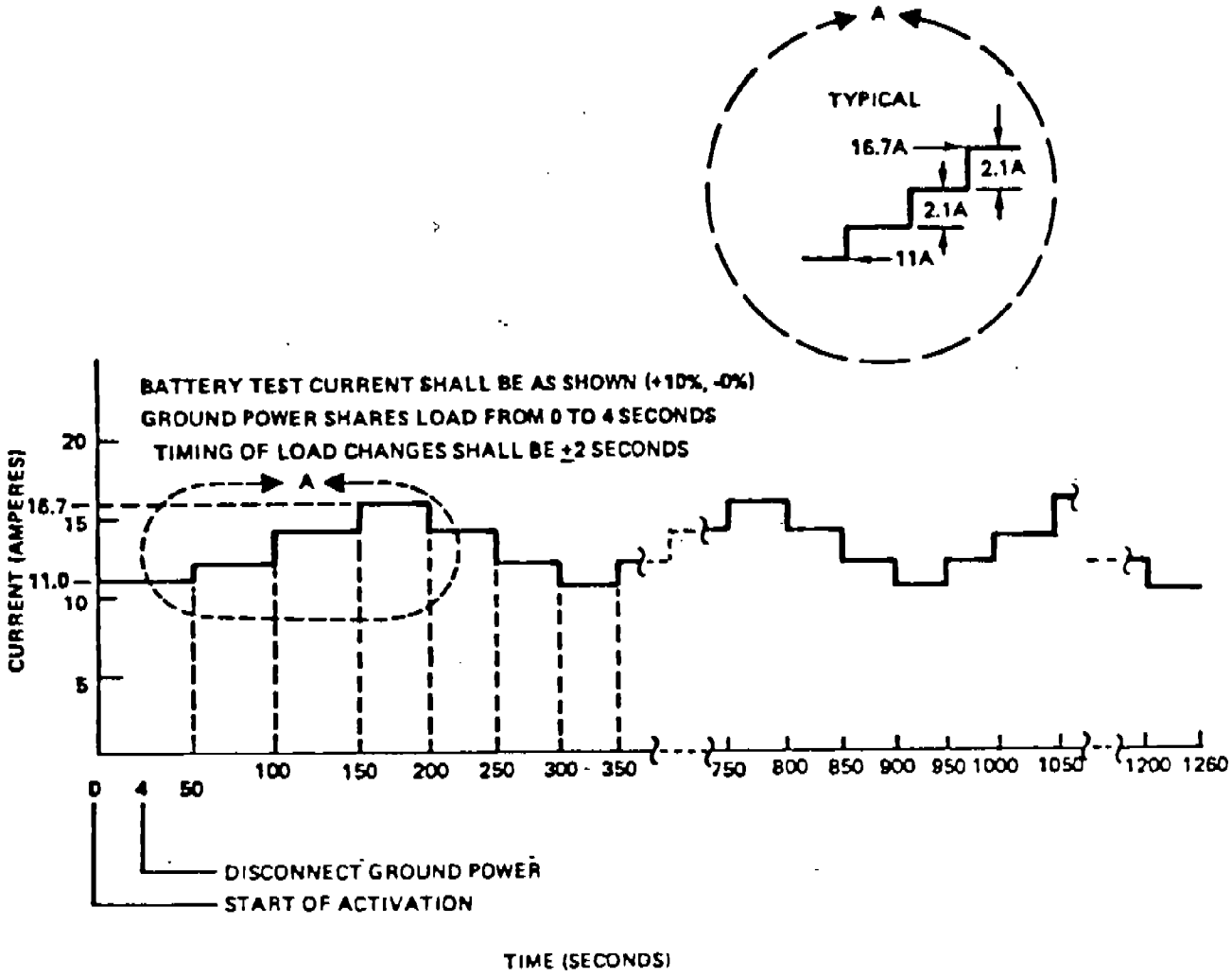


Figure 1. 76.5 Volt Load Profile

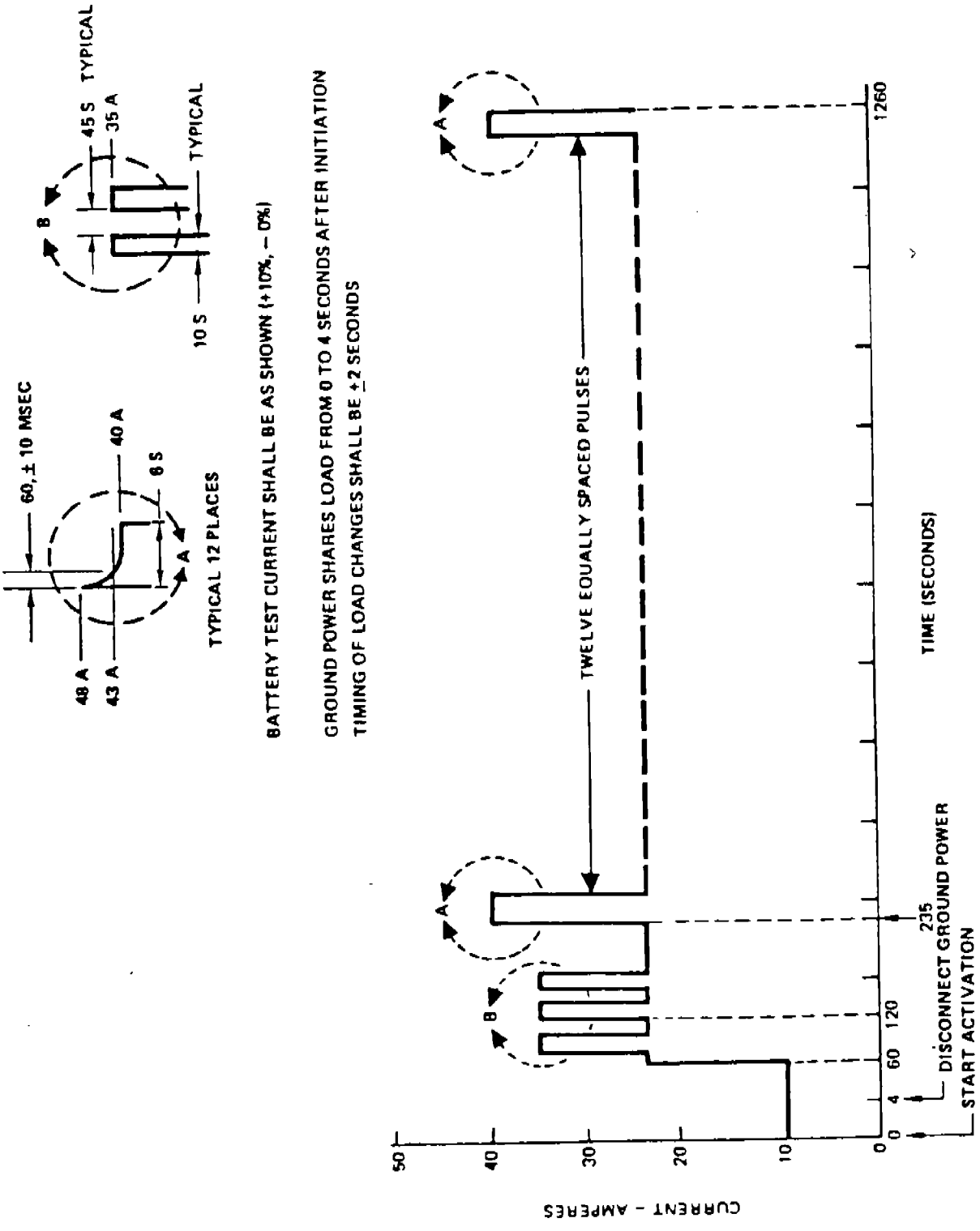
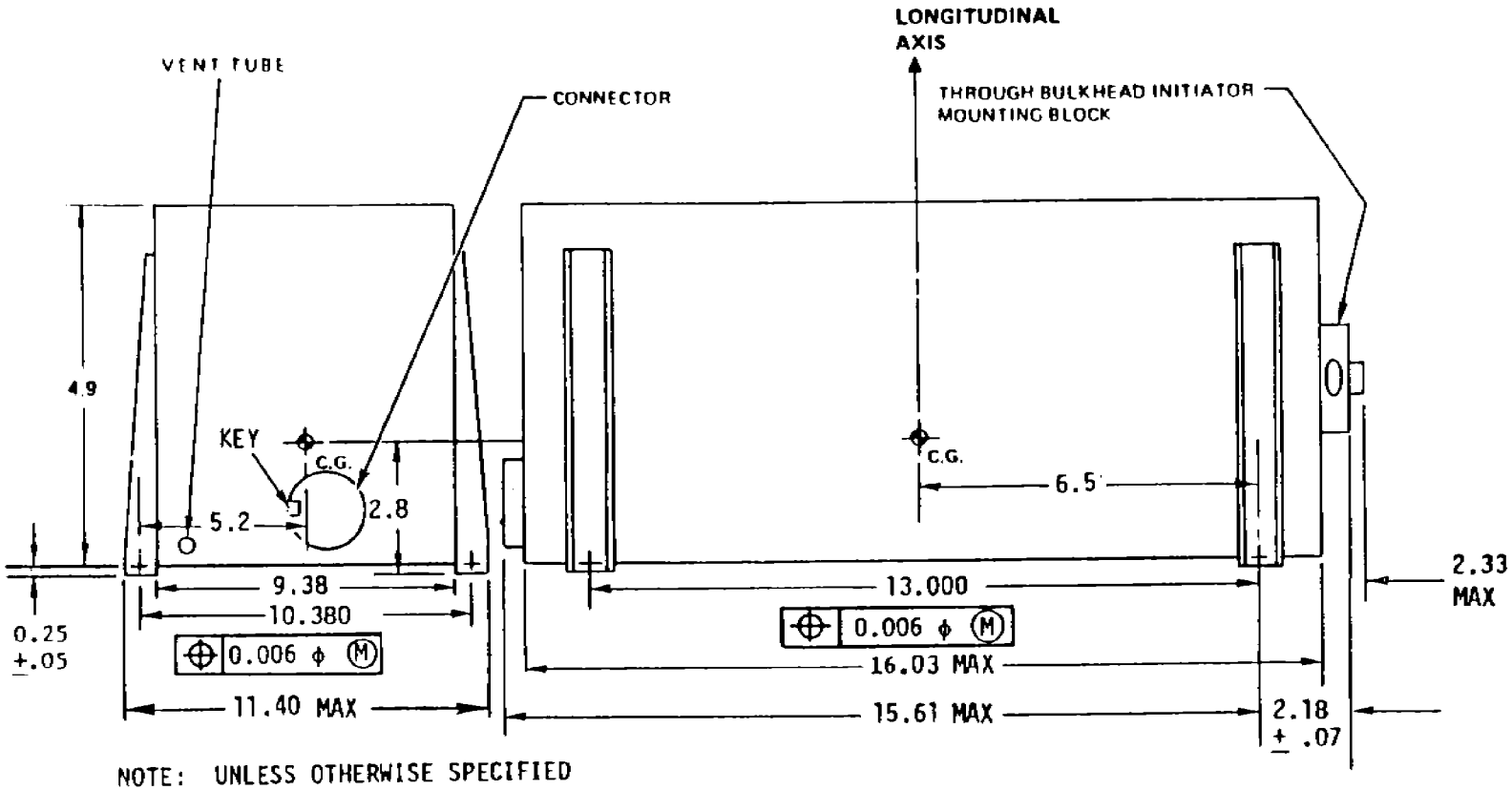


Figure 2. 31.0 Volt Load Profile



NOTE: UNLESS OTHERWISE SPECIFIED

1. ALL DIMENSIONS ARE IN INCHES
2. TOLERANCES { .X = ±0.5, .XX = ±0.03 }
3. C.G. = CENTER OF GRAVITY
4. NOT TO SCALE

Figure 3. Battery Dimensions

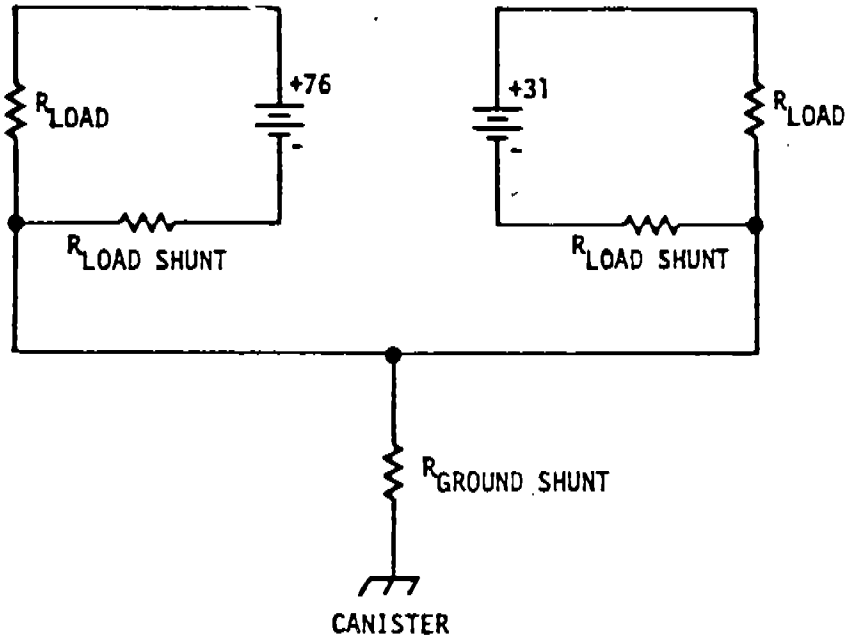


Figure 4. Battery Test Schematic

Table I. Individual Requirements and Tests

Characteristics	Requirements Paragraph	Test Paragraph
Performance		
Insulation resistance	3.2.1.1	4.2.2.1.1
Design and construction		
Production drawings	3.3.1	4.2.2.3.1
Standards of manufacture	3.3.2	4.2.2.3.2
Workmanship	3.3.3	4.2.2.3.3
Helium leak rate	3.3.5	4.2.2.3.5
Electrolyte Leakage	3.3.6	4.2.2.3.6
Mass properties	3.3.7	4.2.2.3.7

Table II. Sampling Performance Requirements/Environmental Tests

Characteristics	Requirement Paragraph Part I (reference)	Requirement Paragraph Part II	Test Paragraph Part II	Temperature (3.2.2.1)	
				47±2°	98±2°
Performance					
Output Voltage	3.2.1.2	3.2.1.2	4.2.2.1.2	(1)	(2)
Load Profile	3.2.1.3	3.2.1.3	4.2.2.1.3	(1)	(2)
Interbattery Isolation	3.2.1.4	3.2.1.4	4.2.2.1.4	(1)	(2)
Leakage Current	3.2.1.5	3.2.1.5	4.2.2.1.5	(1)	(2)
Reverse Current	3.2.1.6	3.2.1.6	4.2.2.1.6	(1)	(2)
Design and Construction					
Electrolyte Leakage	3.3.1.9	3.3.6	4.2.2.3.6	(1)	(2)
Activation	3.3.1.7	3.3.4	4.2.2.3.4	(1)	(2)

NOTES:
(1) Test to be performed on the first sample of each lot.
(2) Test to be performed on the second sample of each lot.

Table III. Classification of Characteristics

Requirement Paragraph	Quality Assurance Paragraph	Characteristic Ref. 4.1.3)		Remarks
		CC	MC	
3.2.1.1 Insulation Resistance	4.2.2.1.1	X		
3.2.1.2 Output Voltage	4.2.2.1.2	X		
3.2.1.2.1 Transient Voltage	4.2.2.1.2	X		
3.2.1.2.2 Voltage Deviations	4.2.2.1.2	X		
3.2.1.3 Load Profile	4.2.2.1.3	X		
3.2.1.4 Interbattery Isolation	4.2.2.1.4	X		
3.2.1.5 Leakage Current	4.2.2.1.5	X		
3.2.1.6 Reverse Current	4.2.2.1.6	X		
3.2.1.6.1 Rate of Changes	4.2.2.1.6	X		
3.2.1.6.2 High Current Period	4.2.2.1.6	X		